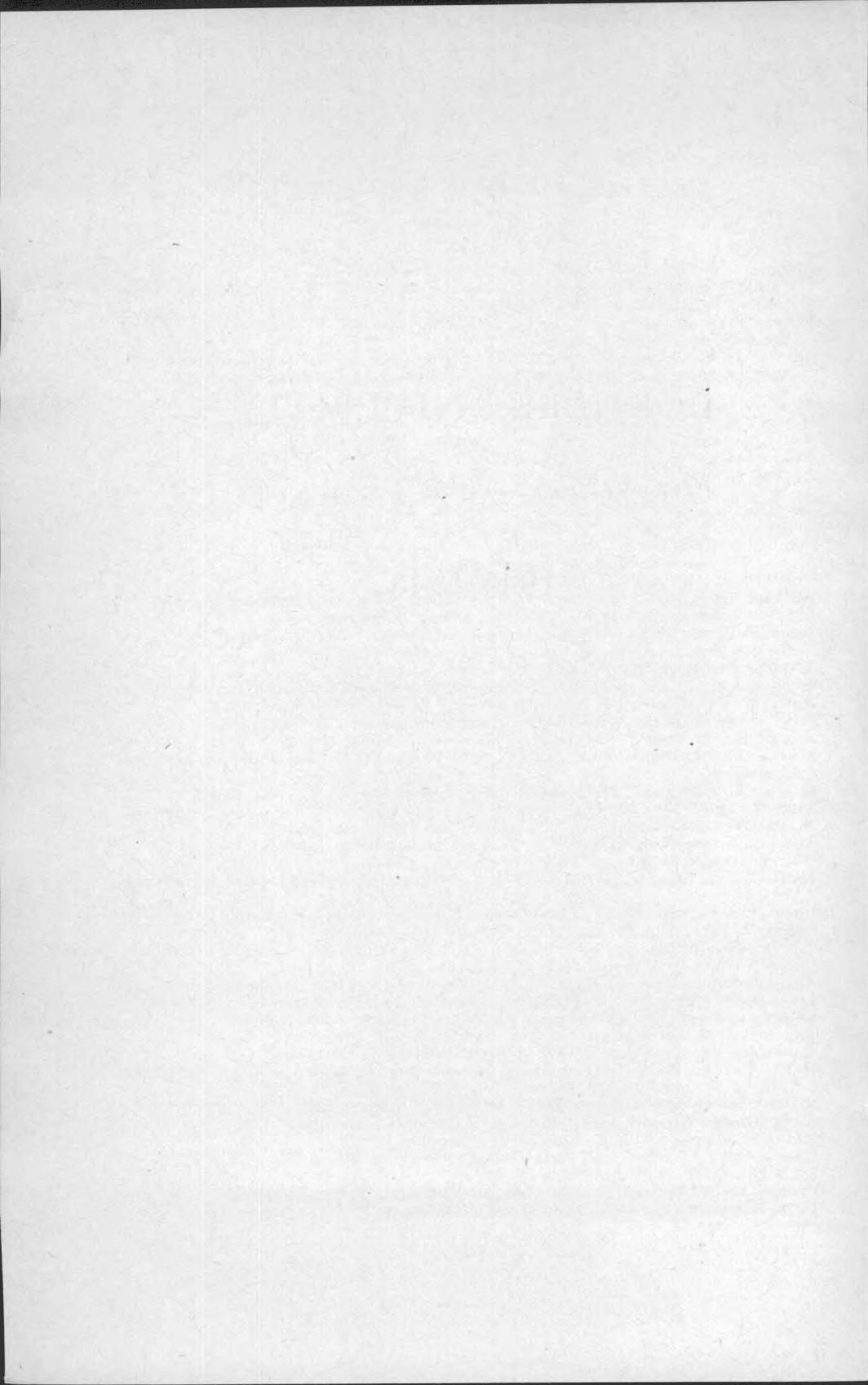


CORNELL UNIVERSITY

COLLEGE OF ARTS & SCIENCES

1945-1946



COLLEGE OF ARTS AND SCIENCES

FACULTY

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ROBERT PELTON SIBLEY, M.A., L.H.D., Assistant Dean and Secretary of the College of Arts and Sciences, and Professor of English.
BLANCHARD LIVINGSTONE RIDEOUT, Ph.D., Chairman of the Advisory Board for Underclassmen, and Associate Professor of the Romance Languages and Literatures.

*GEORGE PLIMPTON ADAMS, JR., Associate Professor of Economics.
HOWARD BERNHARDT ADELMANN, Ph.D., Professor of Histology and Embryology.
RALPH PALMER AGNEW, Ph.D., D.Sc., Professor of Mathematics.
HARRY DARKES ALBRIGHT, Ph.D., Assistant Professor of Speech and Drama.
ARTHUR AUGUSTUS ALLEN, Ph.D., Professor of Ornithology.
ALFRED LEONARD ANDERSON, Ph.D., Associate Professor of Geology.
HOWARD RICHMOND ANDERSON, Ph.D., Professor of Education.
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ROBERT CECIL BALD, Ph.D., Professor of English.
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*KNIGHT BIGGESTAFF, Ph.D., Associate Professor of Chinese History.
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MORTON E. BITTERMAN, Ph.D., Instructor in Psychology.
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JAMES CHESTER BRADLEY, Ph.D., Professor of Entomology and Curator of Invertebrate Zoology.
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HERBERT WHITTAKER BRIGGS, Ph.D., Professor of Government.
THOMAS ROLAND BRIGGS, Ph.D., Professor of Physical Chemistry.
LESLIE NATHAN BROUGHTON, Ph.D., Professor of English, Emeritus.
ARTHUR WESLEY BROWNE, Ph.D., Sc.D., Professor of Inorganic Chemistry, Emeritus.
JAMES DABNEY BURFOOT, JR., Ph.D., Assistant Professor of Geology.
EDWIN ARTHUR BURTT, Ph.D., Susan Linn Sage Professor of Philosophy.
JULIAN EDWARD BUTTERWORTH, Ph.D., Professor of Education.
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ROBERT THEODORE CLAUSEN, Ph.D., Associate Professor of Botany.
JOZEF COHEN, Ph.D., Instructor in Psychology.
GEORGE LOUIS COLEMAN, B.Arch., Assistant Professor of Music, Emeritus.
JACOB ROLAND COLLINS, Ph.D., Professor of Physics.

*Leave of absence.
†Military Service.

- LANE COOPER, Ph.D., Litt.D., Professor of the English Language and Literature, Emeritus.
- LEONARD SLATER COTTRELL, JR., Ph.D., Professor of Sociology.
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- OTIS FREEMAN CURTIS, Ph.D., Professor of Botany.
- †JOHN HAMILTON CURTISS, Ph.D., Assistant Professor of Mathematics.
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- ALEXANDER M. DRUMMOND, A.M., L.H.D., Professor of Speech and Drama.
- ERIC DUDLEY, A.R.A.M., Instructor in Music.
- CHARLES W. DUNN, Ph.D., Instructor in English.
- CHARLES LOVE DURHAM, Ph.D., Litt.D., Professor of Latin, Emeritus.
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- MARIO EINAUDI, Ph.D., Associate Professor of Government.
- ROBERT H. ELIAS, Instructor in English.
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- RICHARD FEYNMAN, Ph.D., Assistant Professor of Physics.
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- FRANK SAMUEL FREEMAN, S.B., Ed.D., Professor of Education and Psychology.
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- CARL WITZ GARTLEIN, Ph.D., Curator in Physics.
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- DONALD J. GROUT, Ph.D., Professor of Music and University Organist.
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- GLENN WASHINGTON HERRICK, B.S.A., Professor of Economic Entomology, Emeritus.
- JAMES LYNN HOARD, Ph.D., Associate Professor of Chemistry.
- *PAUL THOMAS HOMAN, Ph.D., Professor of Economics.
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- HARLEY EARL HOWE, Ph.D., Professor of Physics.
- MELVIN LOVELL HULSE, Ph.D., Associate Professor of Education.
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- WALLIE ABRAHAM HURWITZ, Ph.D., Professor of Mathematics.
- JOHN GREENWOOD BROWN HUTCHINS, Ph.D., Associate Professor of Economics.
- FREDERICK BRUCE HUTT, Ph.D., D.Sc., Professor of Zoology.
- JAMES HUTTON, Ph.D., Professor of the Classics.
- ELIAS HUZAR, Ph.D., Assistant Professor of Government.
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- CLAIRE JAMES, L.R.A.M., A.R.C.M., Instructor in Music.

*Leave of absence.

†Military Service.

- OSKAR AUGUSTUS JOHANNSEN, Ph.D., Professor of Entomology, Emeritus.
 JOHN RAVEN JOHNSON, Ph.D., Professor of Organic Chemistry.
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 OTTO KINKELDEY, Ph.D., Professor of Musicology.
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 *GEORGE L. KREEZER, Ph.D., Assistant Professor of Psychology.
 JOHN M. KUYPERS, B.A., Associate Professor of Music.
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 SAMUEL LEESON LEONARD, Ph.D., Associate Professor of Zoology.
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 FREDERICK GEORGE MARCHAM, Ph.D., Goldwin Smith Professor of English History.
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 ROYAL EWERT MONTGOMERY, Ph.D., Professor of Economics.
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 JOHN GERALD MOORHEAD, Ph.D., Acting Associate Professor of Physics.
 CARLETON CHASE MURDOCK, Ph.D., Professor of Physics.
 ARTHUR EDWARD MURPHY, Ph.D., Professor of Philosophy.
 *HENRY ALONZO MYERS, Ph.D., Associate Professor of English.
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 CURTIS PUTNAM NETTELS, Ph.D., Professor of History.
 CHARLES MERRICK NEVIN, Ph.D., Professor of Geology.
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 MELVIN LORREL NICHOLS, Ph.D., Professor of Chemistry.
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 ROBERT MORRIS OGDEN, Ph.D., Professor of Psychology, Emeritus.
 PAUL MARTIN O'LEARY, Ph.D., Professor of Economics.
 JANET RUSSELL OWENS, Mus.B., Instructor in Music.
 ROBERT PALMER, M.M., Assistant Professor of Music.
 JAMES WENCESLAS PAPEZ, A.B., M.D., Professor of Anatomy.
 JACOB PAPISH, Ph.D., Professor of Chemistry.
 *LYMAN GEORGE PARRATT, Ph.D., Associate Professor of Physics.

*Leave of absence.

†Military Service.

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 *BRUNO ROSSI, Ph.D., Professor of Physics.
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 LEON STILMAN, Instructor in the Russian Language.
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 WILLIAM GEORGE STOBIE, M.A., Instructor in English.
 WILLIAM STRUNK, JR., Ph.D., Professor of English, Emeritus.
 JAMES BATCHELLER SUMNER, Ph.D., Professor of Biochemistry.
 *GERALD FREDERICK TAPE, Ph.D., Instructor in Physics.
 HENRY TAUBE, Ph.D., Assistant Professor of Chemistry.
 CHARLES KENNETH THOMAS, Ph.D., Associate Professor of Speech.
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ANDREW LEON WINSOR, Ph.D., Professor of Psychology.

ALBERT HAZEN WRIGHT, Ph.D., Professor of Zoology.

BENJAMIN PERCY YOUNG, Ph.D., Associate Professor of Zoology.

CHARLES VAN PATTEN YOUNG, A.B., Professor of Physical Education, Emeritus.

*Leave of absence.

ARTS AND SCIENCES

THE COLLEGE OF ARTS AND SCIENCES offers instruction in classical and modern languages and literatures, in history and the social studies, in psychology, philosophy, and music, in mathematics, and in the natural sciences. The student is expected first to pursue certain courses which will complete his basic preparation in English, in a foreign language, in history, and in a laboratory science. During his second year he may select a major field of study for the remainder of his course. This requirement is broadly conceived to include a sequential and a related group of courses by means of which the student is enabled to secure a certain mastery of one non-technical field of knowledge. The remainder of his course of study is largely elective under the supervision of a faculty adviser whom he chooses, and who will assist him in making a reasonable and appropriate selection of courses. Many of the course offerings of the other colleges are available to him, not only as electives but also as related subjects in the fulfillment of his major requirements.

The general purpose of the College of Arts and Sciences is liberal and non-technical. The definition of a liberal college is found in the subjects which make up its curriculum, namely those subjects which in the history of human civilization have differentiated themselves as the means whereby man has come to understand himself and the world in which he lives. The meaning of a liberal education as thus conceived is a special knowledge of some general field of human understanding erected upon a fundamental training in science and the humanities and spreading into such related subjects as will give breadth as well as concentration of knowledge.

The facilities of the college are adequate in staff, housing, and equipment to give personal attention to the varying needs of individual students, especially those of a pre-vocational and pre-professional nature. Advanced courses and opportunities for research are available even in the undergraduate years to those who are qualified to make use of them, for in addition to his regular courses, a student may also work informally under the supervision of his major adviser, and thus in part complete his education in ways more flexible than the usual courses of study will permit. A student is expected to accept a large degree of personal responsibility for shaping his own courses of study, but the student's adviser stands ready to assist him in all possible ways to make the most of his opportunities.

REQUIREMENTS FOR ADMISSION

An applicant for admission to the College of Arts and Sciences must have completed a secondary school course giving satisfactory preparation for the work of the College. Fifteen units of entrance credit are required, representing at least four years' work in a high or preparatory school. The fifteen units should, in the main, be made up of English, foreign language (ancient or modern), mathematics, science, and social studies (including history). Each candidate for admission is required to write the Scholastic Aptitude Test of the College Entrance Examination Board and request the Board to report the result to the Director of Admissions, Cornell University.

Usually the number of applicants exceeds the limited number admissible. A Committee on Admissions selects those to be admitted in any year after a comparative study not only of formal preparation but also of evidences bearing on each applicant's character, seriousness of purpose, and fitness to undertake the work of the College.

Applicants for admission should consult the *General Information Number* issued by the University. That publication contains useful notes on expenses, including tuition charges and fees, scholarships, loan funds, and matters of general student interest. The *General Information Number* and all other official publications of Cornell University may be obtained on application to Cornell University Official Publication, 124 Roberts Place, Ithaca, New York. Application forms are to be had from the University Director of Admissions in Morrill Hall and communications concerning admission should be addressed to him.

REGISTRATION

At the time of registration a student will prepare a program of studies with the aid of an adviser. With the consent of the Dean and the approval of his adviser, a student may alter his list of courses within the first ten days of instruction; thereafter, no student will be permitted to cancel his registration in any course unless he shall previously have obtained from the Dean authorization to do so on the ground of ill health, or for other reasons beyond the student's control.

THE FRESHMAN PROGRAM

I. ADVISERS

Freshmen and sophomores are under the jurisdiction of the Advisory Board for Underclassmen. Each freshman will be assigned to a member of the Faculty who will act as his adviser until he has selected his major adviser. (See page 11, MAJOR SUBJECTS a.) The function of the freshman adviser is to assist the student in his choice of studies, to advise him during the term regarding his work, and generally to give him friendly counsel. The approval of the study card and the signature of the adviser must be obtained before the study card is filed at the office of the Dean.

Special advisory committees have been set up to assist members of the College intending to teach in secondary schools and those intending to study medicine. Interested freshmen are urged to consult early with the proper chairman: for prospective teachers, Associate Professor M. L. HULSE, Goldwin Smith 251; for pre-medical students, Associate Professor L. L. BARNES, Rockefeller 155.

II. NUMBER OF HOURS

An "hour" represents attendance once a week on lecture or recitation, or on a laboratory exercise ordinarily lasting two hours and a half.

A freshman will ordinarily register in his first term for fifteen hours of work, in addition to the required hours in Physical Training and Military Science.

Every student must register in each term for at least twelve hours; no student may register for more than eighteen hours in any term except by permission of the Dean, and such permission will normally not be granted before a student's senior year. A student who has not attained in an academic

year a grade of 70 or better in a total of fifteen hours of work will not be permitted to elect more than fifteen hours in either term of the subsequent academic year. In addition to the required work in Physical Training and Military Science, a student on probation may not register for more than fifteen hours a term. For registration in a course not in the College of Arts and Sciences, the permission of the Dean of this College and of the professor in charge of the course must be obtained.

III. COURSES OPEN TO FRESHMEN (SEE ALSO "PRESCRIBED SUBJECTS")

a. The following are the courses in the College of Arts and Sciences open to freshmen, except that (1) a student may not register for any of these courses for which he has not satisfied the prerequisites, if any are specified (see announcement under each course); (2) a student may not register for any of these courses for which he has presented an acceptable equivalent at entrance:

Astronomy 101, 102
 Biology 1
 Botany 1
 Chemistry 1a, 2a, 102, 110, 115, 203
 Chinese 1
 English 2a, 2b, 10
 The Fine Arts 1a, 1b, *Architecture* 309
 French 1, 3a, 6, 7, 16
 Geology A, 100
 German 1, 1a, 1 b, 3, 3a, 3b, 4, 5, 8
 Government 1, 2
 Greek 1a, 1b, 2a, 2b, 5
 History 2a, 22, 61a, 61b
 Italian 1, 5
 Latin 1a, 1, 4
 Mathematics 1, 5, 10, 15, 16, 20, 55, 65
 Music 1, 11, 15
 Oral and Written Expression A and B
 Philosophy 1a, 1b, 2
 Physics 3, 4, 7, 8, 11, 12
 Physiology 303
 Slavic 1
 Social Science A and B
 Spanish 1, 3, 6, 8
 Speech and Drama 30, 40
 Zoology 1a, 1b, 9

IV. PRESCRIBED SUBJECTS

Before graduation a student must satisfy a requirement in each of the following four groups either by completing the prescribed course or by passing a college-credit examination in its equivalent (see ADMISSION TO ADVANCED STANDING, page 15, and COURSES OPEN TO FRESHMEN, paragraph IIIa).

1. *English*, by completing English 2 or NE 1 and 2 or the interdepartmental course *Oral and Written Expression*, described on page 91.

This course must be begun in the first year of residence. Students excused from the second term of English 2 may complete the requirement by other

courses in English approved by the department, or by Public Speaking 1.

2. *Foreign Languages*, by completing one of the following:—Greek 2a and 2b; Latin 1a; Latin 1; German 4; German 5; French 4a and 5a; French 6; Spanish 6; Italian 5; Russian 3; Chinese 3; any more advanced six-hour courses in these subjects.

A course in a foreign language must be included in the schedule of courses for the first year of residence.

Failure to meet or make satisfactory progress towards the fulfilment of the requirements in English and foreign languages by the end of the sophomore year will be followed by faculty action placing the student on probation or excluding him from the College.

3. *History*, by completing a six-hour unit course, or six hours approved by the department.

4. *Laboratory Science*, by completing one of the following:—Astronomy 180 and 181; General Biology 1; General Botany 1; Chemistry 102 a and b, or 104 a and b, or 110 a and b, or 110a and 115; Geology, six approved hours; Physics 3 and 4, or the equivalent; Zoology 1a and 1b.

A normal schedule for a freshman will include courses in at least one of groups 3 and 4.

a.—A fairly representative program for a freshman in his first term will include, then, three hours of English, three hours of a foreign language, three hours of history, three of a laboratory science, three of Fine Arts or Government or Mathematics or Music or Philosophy, and one hour each of military science and physical training.

b.—Subject to the permission mentioned in Section II, NUMBER OF HOURS, required courses in other colleges in the regular freshman schedule of those colleges may be selected by a freshman in the College of Arts and Sciences, but only after the approval of the Dean of his College and of his adviser has been obtained.

c.—With the permission of the department concerned, a freshman at the end of the first term of a year-course may take a credit examination covering also the work of the second term. This provision applies not only to year-courses but also to such second-term courses as are natural continuations of first-term courses (e.g. Physics 4, following Physics 3, French 4b, following French 4a). The privilege is limited to students of high standing as defined by the department.

UPPERCLASSMEN

I. MAJOR SUBJECTS

a. *Selection of major subject and adviser.* After the first year of residence and before registering for the first term of the third year, a student must select his major subject from options offered by the departments listed below. He must at the same time select as major adviser a designated representative from the department in which he has selected his major subject. During the remainder of his residence he will consult with his major adviser in arranging his course and must obtain his signature to the study card before filing it in the Dean's office.

Astronomy
Botany

Chemistry
The Classics

Economics
English
The Fine Arts
Geology
German
Government
History
Mathematics
Music

Philosophy
Physics
Psychology
Romance Languages
Scandinavian Languages and Literatures
Slavic Languages and Literatures
Sociology and Anthropology
Speech and Drama
Zoology

b. *Major Requirements.* Before graduation, a student must complete courses in satisfaction of the requirement in his major subject. A statement of this requirement, indicating courses and total hours required, appears before the list of courses in each of the departments. He must also complete courses in satisfaction of a requirement in related subjects. A statement of this requirement, with a list of courses from which selection is to be made, appears at the same place. Selection of courses to be offered in satisfaction of these requirements is subject to the restriction that twenty-four hours of the total must be chosen from courses not marked by asterisks. If a comprehensive examination is included in the requirements of the major subject, this must be passed before graduation.

Courses completed before the selection of the major subject, including those offered in satisfaction of requirements in prescribed subjects, may be accepted in satisfaction of these requirements.

Upon recommendation of the major adviser, the Dean may excuse a student registered in this College and in another college of the University from not more than eighteen hours of his major requirements.

c. *Informal Study.*

The major requirements in certain subjects may be satisfied in part by informal study. A statement to this effect appears before the list of courses in those subjects in which informal study is arranged. Departments may require informal study of some or all of their major students, or may admit them to it upon application.

Informal study will consist of reading, reports, experimentation, senior theses, or other work intended to require from the student the expression of initiative in his major subject or in a related field approved by his adviser. This work will be supervised by the major adviser or by a member of the instructing staff approved by him, and may be tested by examination at the option of the department.

A student who has credit for sixty hours of courses is eligible for informal study. He may earn credit by this means to the amount of six hours in the junior year, and of twelve hours in the senior year.

REQUIREMENTS FOR GRADUATION

The College of Arts and Sciences offers one course only, leading to the degree of Bachelor of Arts. This degree will not be conferred upon any student who has not been in residence at Cornell during the last two terms preceding graduation, nor upon any student who has not been in residence during at least two terms in this College and in this College only.

THE DEGREE OF BACHELOR OF ARTS

For graduation with the degree Bachelor of Arts a candidate must meet the following requirements:

1. Credit for one hundred and twenty hours,* of which at least ninety hours must be for courses given in the College of Arts and Sciences. Courses in Hygiene, Military Science and Tactics, and Physical Training, all of which are offered under the jurisdiction of the University but not of any College, may be counted as part of the thirty hours which a student may elect outside the College of Arts and Sciences, but may not be counted as part of the ninety hours required in the College.
2. A grade of 70 or better in at least sixty of the required one hundred and twenty hours. At least one-half of the major requirements, including related subjects (see page 12) must be passed with grades of 70 or better.
3. Election of courses in accordance with Sections IV, p. 10 and I, p. 11.
4. Completion of the work in Military Science and Physical Training as prescribed by the University Faculty. (See pages 92-93.)

BACHELOR OF ARTS WITH DISTINCTION

The degree of Bachelor of Arts with Distinction in the field of a student's major subject will be conferred upon those students who, in addition to having completed the requirements for the degree of Bachelor of Arts, shall (1) have received a grade of 85 or better in at least sixty hours of the courses for which they have been enrolled and an average of 85 in the courses for which they have been enrolled in the field of their major subject and its related courses; (2) have, at the option of the department, taken and passed with distinction a comprehensive examination in the major subject; (3) have been recommended for the said degree by the department representing their major subject.

The degree of Bachelor of Arts with Distinction in all subjects will be conferred upon those students who, in addition to having completed the requirements for the degree Bachelor of Arts, shall (1) have received the grade of 80 or better in at least ninety hours of courses, and of 90 or better in at least sixty of these; (2) not have received a grade below 70 in more than one course; (3) have received no marks lower than 60. To qualify for the degree of Bachelor of Arts with Distinction in all subjects, a candidate must have completed at least sixty hours at Cornell in courses taught in the College of Arts and Sciences; and if he has received credit towards his degree for work done in another institution, the requirement of grades shall be prorated for the residue of work which must be completed in Arts and Sciences at Cornell.

MARKS AND SCHOLASTIC DISCIPLINE

The passing grade is 60; *abs* represents a course left incomplete by a student's absence from the final examination; *inc* represents a course left incomplete for other reasons acceptable to the instructor; *Z*, a course from which a student withdrew without an official cancellation, approved and recorded in the College office.

*Students entering after July 1, 1945 are held for one hundred and twenty academic hours; Military Science and Physical Training are not included in these hours.

No credit towards graduation will be given for a course in which a mark of less than 60 or in which one of \mathcal{Z} is recorded, unless the course be repeated and a passing mark received. A student who has received a mark between 50 and 59, inclusive, in any course that is a prerequisite of any other course may, at the discretion of the department concerned, be regarded as having satisfied the prerequisite; or the department concerned may, before regarding him as having satisfied the prerequisite, require him, by re-examination or otherwise, to secure a passing grade.

A student who, in any course, has received a term mark of "incomplete" or of "absent" may, with the consent of the Dean, and upon payment of the fee required by the University, be permitted to remove the mark, by examination or otherwise, as the department concerned may direct. A mark of incomplete or of absent may not be removed later than registration day of the third term of attendance in the University, dating from the time the course was taken in the class, and no more than one attempt at removal will be allowed.

A student who in any term does not pass twelve hours (excluding courses in hygiene, military science, and physical training), with a grade of 70 or better in at least six of the twelve hours, will be either dropped or placed upon probation. The same penalties may be imposed on students of the College who, having registered in the Summer Session, do not pass a proportionate part of their Summer Session registration with satisfactory grades. Students on probation may not register in any Summer Session other than the Cornell Summer Session with the expectation of receiving credit in this College.

A student's general record may be so unsatisfactory that the Faculty will refuse him permission to continue in the College even though he has passed twelve hours in the preceding term.

A student failing in the last term, or summer session, of his senior year to meet the requirements in hours and grades which is described above, will ordinarily be expected to return for another term, or summer session, wherein he will be held to make a satisfactory record before he will be graduated.

DOUBLE REGISTRATION, ARTS-MEDICINE AND ARTS-LAW

A student who has completed at least ninety hours in courses *given in the College of Arts and Sciences* may, with the permission of the Faculties concerned, be registered both in the College of Arts and Sciences and also in the Cornell University Medical College or the Cornell Law School. (See MAJOR SUBJECTS, Section Ib.) It should be noted, however, that admission to the Medical College is closely restricted, and that in recent years the Medical College has been able to grant this privilege of double registration to only a small proportion of the fourth-year students of the College of Arts and Sciences who applied and who were formally eligible for it.

COMBINED COURSES are offered in Arts and Sciences and Engineering whereby the student may obtain the two degrees in a six-year course. Suggested programs for such six-year courses in Arts and Sciences combined with Civil Engineering, Electrical Engineering, and Mechanical Engineering are published in the *Announcement of the College of Engineering*.

A combined course also leads to the degree A.B. and the degree Master of Fine Arts in a six-year course—see page 42 under Fine Arts.

Students who may be interested in these combined courses should consult the Dean's office as early as possible.

SERVICE PROGRAMS

Beginning with the E. R. C. in 1942 the College has been partly or wholly responsible for administering the academic side of a number of Army programs. These have included the U. S. Military Academy Program, basic phases of the Army Specialized Training Programs, an Army program in Psychology and Personnel, and instruction of groups in German, Italian, Czech, Russian, and Chinese in the so-called Area-Language program, and an Army Intensive Russian course.

When the Navy College Training Program was established in July, 1943, a group of approximately 500 V-12 students was assigned to the College of Arts and Sciences. Since that date a varying number of Marine and Navy students have been enrolled each term. Recently the Bureau of Naval Personnel has announced that Cornell University is to have a permanent NROTC unit, and students who register in this College under the plan will be able to qualify for the A.B. degree if they schedule their courses carefully.

Returning veterans are urged to consult the University Director of Veterans' Education, Professor L. C. Petry, at 13 East Avenue.

ADMISSION TO ADVANCED STANDING

A student admitted to the College of Arts and Sciences from another college of Cornell University, or from any other institution of collegiate rank, including certain programs of study offered to members of the military services, will receive credit toward the degree of Bachelor of Arts for the number of hours to which his records may, in the judgment of the Faculty, entitle him. In order, however, to obtain the degree of Bachelor of Arts, he must, as a candidate for that degree, have been in residence at least two terms in the College of Arts and Sciences, and in that college only, and he must have completed a minimum of thirty hours while thus enrolled.

Credit toward a degree for work done in a preparatory school, upon subjects which may be offered for entrance to the University, may be given only to those students who, in addition to satisfying all entrance requirements, pass separate examinations in the subjects for which they seek college credit. Inquiry regarding such examinations should be addressed to the Office of Admissions, Morrill Hall.

To freshmen in the College of Arts and Sciences these college-credit examinations are open at the end of their first term as well as at entrance. Moreover, freshmen of this College may take college-credit examinations in subjects for which no entrance credits have been offered provided they furnish the department concerned with evidence of preparation warranting the examination.

CREDIT FOR SUMMER SESSION

Credit for work done in summer sessions at Cornell or elsewhere may be granted to the extent of thirty hours. Applications for such credit must be filed in the Dean's office, where they will be considered and acted upon in accordance with their merits.

SCHOLARSHIPS AND PRIZES

Scholarships open to students of Arts and Sciences as members of the University are listed in the *General Information Number*. Only students of Arts and Sciences are eligible for the four scholarships and two prizes described below.

THE GEORGE C. BOLDT MEMORIAL SCHOLARSHIPS

Mr. George C. Boldt, jr., has created three scholarships, each of them worth four hundred dollars in 1944, as a memorial to his father. These scholarships will be awarded at the close of the junior year to the three men students of the College who shall be considered most deserving of this aid. Applications for these scholarships must be filed in the Office of the Dean before March 15 of the academic year preceding the year for which they are awarded. Students enrolled both in this College and in the Law School, the Medical College, or the Graduate School are not eligible.

THE CORNELIA L. HALL SCHOLARSHIP

A gift of the late Mary F. Hall has established the Cornelia L. Hall Scholarship, worth one hundred and twenty dollars, "open to any meritorious young woman of this State, who is pursuing the studies of the A.B. course and who is in need of financial assistance." Under the terms of the bequest preference must be given to a suitable candidate from Tioga, Tompkins, or Chemung County; within this preferred class, women of senior or junior standing will be regarded as entitled to first consideration. Applications for the scholarship must be filed in the Office of the Dean before March 15 of the academic year preceding the year for which it is awarded.

Prizes open to students of Arts and Sciences as members of Cornell University are listed in the *Announcement of Prize Competitions*. Competition for the following prizes is limited to students of Arts and Sciences.

THE JULIETTE MACMONNIES COURANT PRIZE

The Juliette MacMonnies Courant Prize, founded by Mrs. Margaret MacMonnies Courant in memory of her daughter, consists of about forty dollars, either in cash or books as the recipient may determine. It is awarded annually to that woman student of the senior class whose major subject is French and who shall, in the opinion of the committee of award, have made the best record in her four years of work, with especial reference to facility of expression in French.

THE DUNIWAY PRIZE

The Duniway Prize, founded by a bequest of the late Clyde A. Duniway, will be awarded annually to the best senior majoring in History or in Government and shall consist of books in the fields of History and Government to the value of approximately thirty dollars. In selecting the winning candidate the committee of award shall take into account his academic record, his ability to express himself clearly and idiomatically in speaking and writing, and his scholarly approach.

COURSES OF INSTRUCTION

The following list of courses may be offered in the academic terms of 1945-46. The list does not include the special programs of the Army and Navy at Cornell. For information concerning time and place of meeting and staff assignments, consult the Supplementary Announcement which will be issued at the beginning of each term.

ASTRONOMY

Mr. R. W. SHAW, *Chairman*; Messrs. D. A. MACRAE and R. E. WILLIAMSON.

For a major in Astronomy the following courses must be completed: (1) in Astronomy, courses 101, 102, 182 or M-9, six hours of Interpretational Astronomy, six hours of Observational Astronomy, six hours of electives; (2) in related subjects, at least fifteen hours selected from approved courses in Chemistry, Geology, Mathematics, and Physics.

GENERAL COURSES

101. *INTRODUCTION TO ASTRONOMY*. Fall term. Credit three hours. Lectures, T Th 9 or 11. *Rockefeller C.* One two-hour laboratory or observatory period a week to be arranged. Mr. SHAW.

Fundamentals of astronomy with emphasis on the Planets, Moon, Comets, Meteors, the Solar System as a Unit, and Telescopes. References to the contributions of astronomy to the sciences, philosophy, and general culture. Opportunity for observation with the great telescope.

102. *INTRODUCTION TO ASTRONOMY*. Spring term. Credit three hours. Lectures, T Th 9 or 11. *Rockefeller C.* One two-hour laboratory or observatory period a week to be arranged. Mr. SHAW.

Fundamentals of astronomy with emphasis on the Sun, the Stars, the Galaxy, and the Sidereal Universe. Opportunity for observation with the great telescope.

NAVIGATION

A-10. *AIR NAVIGATION*. Either term. Credit three hours. *Rockefeller 358*. Hours to be arranged. Mr. SHAW.

Practical course in the science of finding the position of an airplane relative to the earth's surface. Includes contact flying, dead reckoning, wind determination, radio navigation, celestial navigation. Practice in the use of airplane computers, compasses, charts, radio, and sextants. Covers all material needed in navigation for C.A.A. certificates.

M-8. *NAVIGATION AND NAUTICAL ASTRONOMY I*. Credit three hours. Prerequisite, Elements of Plane Trigonometry. *Rockefeller 357*. Hours to be announced. STAFF.

Instruments, compass corrections, charts, the sailing, dead reckoning, piloting.

M-9. *NAVIGATION AND NAUTICAL ASTRONOMY II*. Credit three hours. Prerequisite, M-8. *Rockefeller 357*. Hours to be announced. STAFF.
Instruction in all branches of celestial navigation.

INTERPRETATIONAL ASTRONOMY

121. *ORIGIN OF THE SOLAR SYSTEM*. Fall term. Credit three hours. Prerequisite, Astronomy 101 and 102, or General Geology, or the Calculus. *Rockefeller* 358. Hours to be arranged. Mr. SHAW.

A detailed consideration of the properties of the members of the solar system and of their origin according to Kant, Laplace, Moulton and Chamberlain, Jeans, Jeffreys, Lyttleton, and others. Darwin's theory of the moon. Other planetary systems. Comments on the general problem of origins.

131. *STELLAR INTERIORS*. Fall term. Credit three hours. Prerequisite, the Calculus. *Rockefeller* 358. Hours to be arranged. Mr. WILLIAMSON.

Review of the fundamental observational material—masses, diameters, and temperatures—pertinent to the theory of stellar interiors. Mechanisms of energy transfer and the theory of internal structure. Sources of stellar energy including nuclear reactions and the carbon cycle. Special problems of supergiants and white dwarf stars.

[138. *ASTROCHEMISTRY*. Spring term. Credit three hours. Prerequisite, the Calculus. *Rockefeller* 358. Hours to be arranged. Mr. SHAW. Not given in 1945-46.]

141. *THE GALAXY*. Fall term. Credit three hours. Prerequisite, the Calculus. *Rockefeller* 358. Hours to be arranged. Mr. MACRAE.

A study of the Milky Way, its components, dimensions, age, motions, and relation to the Universe. Attention will be given to the observations which are the source of our information. Applications of statistical mathematics to astronomical problems will be included.

144. *EXTERNAL GALAXIES*. Spring term. Credit three hours. Prerequisite, the Calculus. *Rockefeller* 358. Hours to be arranged. Mr. MACRAE.

A study of the forms, components, distances, and distribution of the extragalactic stellar systems. Our knowledge of the Magellanic Clouds, the neighboring systems, the meta-galaxy, and the expanding universe from modern investigations.

154. *THEORY OF ORBITS*. Spring term. Credit three hours. Prerequisite, Differential Equations. *Rockefeller* 358. Hours to be arranged. Mr. WILLIAMSON.

Theory of orbits of objects moving according to Newton's Law of Gravitation. Determination of the elements of the orbit of a comet or asteroid from three or more observations. Use of computing machines. Study of the fundamental problems of rocket travel from the earth to other members of the solar system.

159. *SPECIAL TOPICS IN ASTRONOMY*. Either term. Credit one to three hours a term. Hours to be arranged. STAFF.

Qualified students may receive instruction in special topics selected according to their needs and preparation.

OBSERVATIONAL ASTRONOMY

162. *ASTRONOMICAL SPECTROSCOPY*. Spring term. Credit three hours. One hour lecture and two three-hour laboratory periods to be arranged. Approval of instructor required before registration. STAFF.

Spectroscopic instruments, measurement of wave-length, multiplet structure, identification of spectral lines, stellar spectra classification, measurement of radial velocities, solution of orbit of a spectroscopic binary, spectrophotometry, and related topics. Emphasis is placed on observational methods and laboratory techniques rather than on interpretation.

[164. *ASTROMETRY*. Credit three hours. Not offered in 1945-46.]

[166. *ASTRONOMICAL PHOTOMETRY*. Credit three hours. Not offered in 1945-46.]

POSITIONAL ASTRONOMY

182. *FIELD ASTRONOMY*. Spring term. Credit two hours. Prerequisite, Plane Trigonometry. One lecture and one afternoon or evening observation period to be arranged. Mr. SHAW.

Basic theory and practice in the determination of Latitude, Longitude, Time, and the Azimuth of a Line. Practice with the surveyor's transit, the sextant, and the theodolite. Fundamentals of spherical trigonometry will be included in the course.

[186. *GEODETIC ASTRONOMY*. Spring term. Credit three hours. Prerequisite, Astronomy 182. Lectures and observation periods to be arranged. Not given in 1945-46.]

Practice and theory of the precise determination of position and time. Consideration of the figure of the earth and certain special properties of the earth such as magnetism, continental drift, isostasy, etc. The laboratory is equipped with a zenith telescope, meridian transit, precision transit, clocks, time signal radio, gravity pendulum, magnetic equipment, and supplementary apparatus.

GRADUATE COURSES

257. *STELLAR DYNAMICS*. Either term. Credit three hours. *Rockefeller* 358. Hours to be arranged. Mr. WILLIAMSON. See Graduate School Announcement.

BIBLIOLOGY

Mr. OTTO KINKELDEY.

[*BIBLIOLOGY 1* (Bibliography). Fall term. Credit two hours. T Th 12. *University Library*. Mr. KINKELDEY. Not given in 1945-46.]

The book as a source of information: the reference book; the handbook; book lists, general and special; catalogues and trade lists, their use.

[*BIBLIOLOGY 2*. Spring term. Credit two hours. T Th 12. *University Library*. Mr. KINKELDEY. Not given in 1945-46.]

The Book: its origin and evolution. Not a literary course, but a study of the book as a means of the conservation of thought, a manifestation of civilization and culture, its relation to the arts and crafts.

BOTANY

Mr. LEWIS KNUDSON, *Chairman*; Messrs. H. W. BLASER, D. G. CLARK, R. T. CLAUSEN, O. F. CURTIS, V. M. CUTTER, A. J. EAMES, R. A. LAUBENGAYER, W. C. MUENSCHER, L. C. PETRY, L. F. RANDOLPH, and L. W. SHARP.

For a major in Botany the following courses must be completed: (1) in Botany, course 1, 31, 117, 123 or 124 or 126; one additional course of three or more hours credit; (2) in related subjects, eighteen hours selected from approved courses in Chemistry, Biochemistry, Entomology, Zoology, Bacteriology, Plant Pathology, and Geology. The course in genetics may be offered either as a course in Botany or in the related subjects.

For a major in Botany with advanced work in Bacteriology, the following courses must be completed: (1) in Botany, courses 1, 31, 117; in Bacteriology, eight hours of advanced courses approved by the Department of Botany; (2) in related subjects, eighteen hours to be selected from the list given in the paragraph above.

Provisions are made for a limited number of students to undertake informal study.

1. **GENERAL BOTANY.** Fall and Spring terms. Credit three hours a term. If taken after Biology 1, credit two hours a term. Lectures, T Th 11, *Plant Science* 233. Laboratory, one period of two and one-half hours. Mr. PETRY and instructors.

A survey of the fundamental facts and principles of plant life. The work of the first term deals with the structures and functions of the higher plants, with special emphasis on their nutrition. The work of the second term traces the evolution of the plant kingdom, as illustrated by representatives of the principal groups, and concludes with a brief introduction to the principles of classification of the flowering plants.

13. **TREES AND SHRUBS.** Fall term. Credit four hours. Prerequisite, course 1 or its equivalent. Lectures, T Th 9. *Plant Science* 143. Laboratory or field work, T Th 1:40-4. *Plant Science* 211. Mr. CLAUSEN.

The identification of trees and shrubs in summer and in winter conditions. During the first part of the term the work on identification is done largely in the field. The work of the latter part of the term is a study of the classification of woody plants.

31. **PLANT PHYSIOLOGY.** Fall term; repeated in spring term. Credit four hours. Prerequisite, course 1 and introductory Chemistry. Lectures, T Th 10, *Plant Science* 143. Laboratory, T Th 1:40-4. *Plant Science* 227. Messrs. KNUDSON, O. F. CURTIS or CLARK.

This course is designed to acquaint the student with the general principles of plant physiology. Topics such as water relations, photosynthesis, translocation, digestion, respiration, mineral nutrition, growth, and reproduction are studied in detail. Particular emphasis is placed, both in laboratory and in classroom, on discussion of principles and their application to plants.

51. **ECONOMIC BOTANY.** Fall term. Credit three hours. Lectures, T Th 8. Laboratory, M 1:40-4. *Plant Science* 353. Mr. MUENSCHER and assistant.

A treatment of the source, distribution, cultivation, and utilization of the principal economic plants of the world. Special emphasis is given to morphological and ecological characteristics of the crop plants that supply the chief sources of products utilized for foods, beverages, drugs, fibers, and shelter.

55. *WEEDS AND POISONOUS PLANTS*. Fall term. Credit three hours. Prerequisite, course 1 or its equivalent. Lecture, F 8. Laboratory, W F 1:40-4. Plant Science 353. Mr. MUENSCHER and assistant.

Special emphasis is given to the habits, characteristics, and properties which make weeds and poisonous plants harmful or undesirable, the losses and injury produced by them, and the methods for their prevention, eradication, and control. Field and laboratory practice in the identification of common weeds and poisonous plants is included.

56. *SEED ANALYSIS*. Spring term. Credit one hour. Prerequisite, course 1 or its equivalent. Lectures and laboratory, F 1:40-4. *Plant Science* 353. Mr. MUENSCHER and assistant.

A course designed for students in the applied plant-science departments and those interested in preparing to be seed analysts. Practice is given in making purity analyses and germination tests according to standard and official methods and recommendations. Opportunity is provided for practice in the identification of weed-seed impurities and in the application of special treatments required for germinating dormant seeds.

115. *AQUATIC PLANTS*. Spring term. Credit three hours. Prerequisite, course 1 or its equivalent. Lecture, M 9. Laboratory, M W 1:40-4. *Plant Science* 353. Mr. MUENSCHER.

A study of the taxonomy and ecology of fresh-water plants, beginning with the algae and concluding with the aquatic angiosperms.

117. *TAXONOMY OF VASCULAR PLANTS*. Spring term. Credit four hours. Prerequisite, course 1 or its equivalent. Lectures, T Th 9. *Plant Science* 143. Laboratory, T Th 1:40-4. *Plant Science* 211. Mr. CLAUSEN.

A study of the kinds of seed plants and ferns, their classification into genera, families, and orders, and field work on the local flora. Emphasis is placed on wild plants, but the more common cultivated plants receive some attention. The course is planned to follow course 1 and to furnish an introduction to the knowledge of field botany and classification of the higher plants, in preparation for special work in various departments, and as an aid in teaching. Instruction is given in the preparation of an herbarium and of keys.

Several afternoon and one or two all-day field trips are scheduled in May. Students completing this course may arrange, under course 171, to pursue special advanced work in taxonomy.

Comparative Morphology of Fungi. Given in the Department of Plant Pathology.

123. *PLANT ANATOMY*. Fall term. Credit four hours. Prerequisite, course 1 or its equivalent, and permission to register. Lecture and laboratory, T 9-12:30; Th S 9-11:30. *Plant Science* 228. Mr. BLASER.

This course is designed to give a working acquaintance with the internal morphology of vascular plants, and emphasis is placed on practice in inter-

pretation and determination of material. The course is planned primarily for students in applied fields of botany, such as pathology, pomology, or genetics. Students desiring a less detailed training in this subject should take course 126.

124. *CYTOLOGY*. Fall term. Credit four hours. Prerequisite, course 1 or Zoology 1 or its equivalent. Conferences, M W 9. *Plant Science* 143. Laboratory, M W or T Th 10-12:30. Assignment to laboratory section must be made at time of registration. Mr. SHARP.

The principal topics considered are protoplasm, cells and their components, nuclear and cell division, meiosis and fertilization, and the relation of these to the problems of development, reproduction, taxonomy, and heredity. Both plant and animal materials are used. Microtechnic is not included.

126. *MORPHOLOGY OF VASCULAR PLANTS*. Fall and spring terms. First term is prerequisite to second. Credit three hours a term. Prerequisite, course 1 or its equivalent, and permission to register. Lecture, F 9. *Plant Science* 143. Laboratory, W 9-12:30, F 10-11:30. *Plant Science* 228. Mr. EAMES.

An advanced course in the comparative morphology, life histories, and phylogeny of vascular plants.

171. *SPECIAL PROBLEMS IN GENERAL BOTANY, TAXONOMY, MORPHOLOGY, ANATOMY, PALEOBOTANY, ECONOMIC BOTANY, CYTOLOGY, AND PHYSIOLOGY*. Fall and spring terms. Credit not less than two hours a term.

Students engaged in special problems or making special studies may register in this course. They must satisfy the instructor under whom the work is taken that their preparation warrants their choice of problem.

219. *ADVANCED TAXONOMY OF VASCULAR PLANTS*. Fall term. Credit two hours. Prerequisite, course 117 or its equivalent and training in cytology and genetics. Lecture, T 11. Practice, Th 11. *Plant Science* 211. Mr. CLAUSEN.

A course designed particularly for students majoring in taxonomy. Emphasis is placed on the three phases of taxonomic study: floristics, experimental taxonomy, and monographing. The work of the first part of the term is done largely in the field. In the latter part of the term, each student does practical work on some group of plants.

224. *ADVANCED CYTOLOGY*. Spring term. Credit two hours. Prerequisite, course 124, Plant Breeding 101, and permission to register. Lecture, W 9. *Plant Science* 143. Laboratory and seminar arranged. Mr. SHARP.

An advanced course dealing mainly with the physical basis of heredity and with recent research in cytogenetics and cytotaxonomy.

231. *PLANT PHYSIOLOGY, ADVANCED LECTURE COURSE*. Fall and spring terms. Credit three hours a term. Limited to seniors and graduate students. Prerequisite, training in botany and chemistry, to be determined in each case by the department. Lectures, M W F 10. *Plant Science* 143. Messrs. KNUDSON and O. F. CURTIS.

232. *PLANT PHYSIOLOGY, ADVANCED LABORATORY COURSE.* Fall and spring terms. Credit three hours a term. Prerequisite or parallel, course 231. Breakage deposit, \$5. Laboratory, M 1:40-4, S 8-12:30. *Plant Science* 241. Messrs. KNUDSON, O. F. CURTIS, and CLARK.

CHEMISTRY

Mr. P. DEBYE, *Chairman*; Messrs. SIMON H. BAUER, ALFRED T. BLUMQUIST, T. R. BRIGGS, CORNELIUS K. CAIN, JAMES L. HOARD, JOHN R. JOHNSON, A. LETCHER JONES, JOHN G. KIRKWOOD, A. W. LAUBENGAYER, FRANKLIN A. LONG, WILLIAM T. MILLER, MELVIN L. NICHOLS, J. PAPISH, CHARLES RUSSELL, and HENRY TAUBE.

All courses listed below are to be given in the Baker Laboratory of Chemistry.

For a major in Chemistry, the following courses must be completed: (1) in Chemistry, courses 102a and b or 104a and b, 205 and 206, or 210; or preferably 110a and b, 115, and 203; 220 and 221, or 225; 305a and b, 310a; 406a and b, 410a; and six hours of electives; (2) in related subjects, Mathematics 55a and 55b, or 65a, 65b and 65c, Physics 3 and 4 or 7 and 8, German 1 or 1a unless two units have been offered for entrance.

INORGANIC CHEMISTRY

Students exceptionally well prepared in chemistry should read the section on page 15, in regard to College Credit Examinations.

1a. *GENERAL CHEMISTRY (NAVY CHEMISTRY 1a).* One term. Credit four hours. Lectures: Th S 8 or 9. Main Lecture Room, *Baker* 200. Laboratory, M T W Th or F 1:40-4:30 or S 9-12. *Baker* 50 and 150. Recitation, one hour to be arranged.

This course, together with Chemistry 2a will be substantially the equivalent of Chemistry 102 or 104. They deal with the fundamental laws and theories of chemistry and the properties of the more common elements and their compounds.

2a. *GENERAL CHEMISTRY (NAVY CHEMISTRY 2a).* One term. Credit two hours. Prerequisite, Chemistry 1 or 1a. Lecture, T 8 or 9. Main Lecture Room, *Baker* 200. Laboratory, M T W Th or F 1:40-4:30 or S 8-11. *Baker* 50 and 150.

Chemistry 1 and 2 will not be given. Those students wanting a short introduction to qualitative analysis should register for Chemistry 210 which may be taken concurrently with or after Chemistry 2a.

102a, 102b. *GENERAL CHEMISTRY.* Two terms. Credit three hours a term. First term prerequisite to second. Open only to those students who do not offer entrance chemistry.

This course deals with the fundamental laws and theories of chemistry and the properties of the more common elements and their compounds.

104a, 104b. *GENERAL CHEMISTRY.* Two terms. Credit three hours a term. First term prerequisite to second. Open to those students who offer entrance chemistry.

This course deals with the fundamental laws and theories of chemistry and the properties of the more common elements and their compounds.

110a. *INTRODUCTORY INORGANIC CHEMISTRY*. One term. Credit three hours. Prerequisite, entrance credit in chemistry or Chemistry 102. Must be taken concurrently with Chemistry 115. Required of candidates for the degree of B.Chem.Eng., and recommended for candidates for the degree of A.B. who intend to major in Chemistry. Lectures, M W F 1:40. *Baker* 107.

110b. *INTRODUCTORY INORGANIC CHEMISTRY*. One term. Credit two hours. Prerequisite, Chemistry 110a. Lectures, W F 8. *Baker* 107.

115. *INTRODUCTORY INORGANIC CHEMISTRY*. One term. Credit three hours. Must be taken concurrently with Chemistry 110a. Recitation, M or W 2:30. Laboratory, T Th 8-10:30. *Baker* 150.

130a, 130b. *ADVANCED INORGANIC CHEMISTRY*. Two terms. Credit three hours a term. Prerequisite or parallel courses, Chemistry 405a and b or 406a and b. Lectures, M W F 11. *Baker* 107.

The elements are discussed in the order in which they appear in the Periodic System, with special attention to the bearing of atomic structure on the properties of elements and their compounds and on the relations between the group. The less familiar elements are treated in detail and the stereochemistry of inorganic substances is treated.

135. *ADVANCED INORGANIC CHEMISTRY*. One term. Credit two to six hours. Prerequisite, Chemistry 305 and 310.

Laboratory practice. The preparation, purification, properties, and reactions of inorganic compounds, including those of the rarer elements.

Chemistry 135 is designed to accompany Chemistry 130, but either course may be taken separately.

[140. *SELECTED TOPICS IN ADVANCED INORGANIC CHEMISTRY*. One term. Credit two hours. Prerequisite, Chemistry 405 and 410, or special permission. Not given in 1945-46.]

165. *CHEMISTRY OF THE RARE ELEMENTS*. One term. Credit two or more hours. Prerequisite, Chemistry 130.

Laboratory practice. Extraction, recovery, and purification of the rare elements, and preparation of their salts. Chemical analysis of the rare elements.

195. *RESEARCH FOR SENIORS*. Two terms. Credit two or more hours a term.

ANALYTICAL CHEMISTRY

[201. *INTRODUCTORY ANALYTICAL CHEMISTRY*. One term. Credit four hours. Prerequisite, Chemistry 1a and 2a. Primarily for students majoring in the biological sciences. Mr. NICHOLS and assistants. Lectures: T Th 10. *Baker* 177. Laboratory section: M W 1:40-4. *Baker* 252.

A study of the fundamental principles of qualitative and quantitative analysis. Laboratory practice in gravimetric and volumetric quantitative methods. Not given in 1945-46.]

203. *INTRODUCTORY QUALITATIVE ANALYSIS*. One term. Credit five hours. Prerequisite, Chemistry 110a and Chemistry 115. Must be taken with Chemistry 110b except by permission of the instructor. Required of candidates for the degree of B.Chem. Eng. and recommended for candidates for the degree of A.B. who intend to major in Chemistry. Mr. BAUER and assistants. Lecture, M 8. *Baker* 107. Recitation: W 9 or W 12. *Baker* 18. Laboratory, M W F 1:40-4. *Baker* 50.

A study of the application of the theories of general chemistry and the properties and reactions of the common elements and acid radicals to their systematic separation and detection, and their detection in various solutions and solids.

[205. *INTRODUCTORY QUALITATIVE ANALYSIS*. One term. Credit three hours. Prerequisite, Chemistry 1a and 2a. Must be taken with Chemistry 206. Mr. BAUER and assistants. Lectures, M W 9. *Baker* 22. Recitation, F 9. *Baker* 22.

A study of the application of the theories of general chemistry to the systematic separation and detection of the common elements and acid radicals. Not given in 1945-46.]

[206. *INTRODUCTORY QUALITATIVE ANALYSIS*. One term. Credit three hours. Prerequisite, Chemistry 1a and 2a. Must be taken with Chemistry 205. Mr. BAUER and assistants. Laboratory, M W F 1:40-4. *Baker* 50.

A study of the properties and reactions of the common elements and acid radicals, and their detection in various solutions. Not given in 1945-46.]

210. *INTRODUCTORY QUALITATIVE ANALYSIS*. Shorter course. One term. Credit three hours. Prerequisite, Chemistry 1a and 2a. Open to those who are taking Chemistry 2a. Mr. BAUER and assistants. Lecture, W 10. Main Lecture Room, *Baker* 200. Recitation, M 10. Required only of those also taking Chemistry 2a. *Baker* 18. Laboratory, T Th 1:40-4:30. *Baker* 50.

A study of the properties and reactions of the common elements and acid radicals, and their detection in various solutions.

220. *INTRODUCTORY QUANTITATIVE ANALYSIS*. One term. Credit three hours. Prerequisite, Chemistry 203 or 210. Must be taken with Chemistry 221. Required of candidates for the degree of B.Chem.Eng. and recommended for candidates for the degree of A.B. with a major in Chemistry. Mr. NICHOLS, Mr. JONES, and assistants. Lectures, T Th 9. *Baker* 207. Recitation, Th 10. *Baker* 206.

A study of the fundamental principles of gravimetric and volumetric analysis with practice in stoichiometry.

221. *INTRODUCTORY QUANTITATIVE ANALYSIS*. One term. Credit three hours. Prerequisite, Chemistry 203 or 210. Must be taken with Chemistry 220. Required of candidates for the degree of B.Chem.Eng. and recommended for candidates for the degree of A.B. with a major in Chemistry. Mr. NICHOLS, Mr. JONES and assistants. Laboratory: F 1:30-4:30, S 8-12. *Baker* 252.

Laboratory practice in the preparation and standardization of various volumetric solutions and the analysis of a variety of substances by volumetric and gravimetric methods.

225. *INTRODUCTORY QUANTITATIVE ANALYSIS*. Shorter course. One term. Credit four hours. Prerequisite, Chemistry 203 or 210. Mr. JONES and assistants. Lectures, M W 8. *Baker* 207. Laboratory, T Th 8-10:30; or T Th 10:40-4. *Baker* 252.

A study of the fundamental principles of gravimetric and volumetric analysis, and the analysis of various substances by these methods.

230. *ADVANCED QUANTITATIVE ANALYSIS*. One term. Credit three hours. Prerequisite, Chemistry 220 and 221 or special permission. Mr. NICHOLS, Mr. JONES, and assistants. Recitation, one hour a week, to be arranged. Laboratory, T Th 8-12:30, T Th 1:40-4, S 8-1. *Baker* 294. Students will be assigned to a combination of laboratory periods that will total seven and one-half hours a week.

The calibration of weights and volumetric apparatus; the analysis of ferrous and non-ferrous alloys, silicates, and organic substances by various gravimetric, volumetric, colorimetric, and combustion methods.

[235. *ADVANCED QUANTITATIVE ANALYSIS*. One term. Credit two hours. Prerequisite, Chemistry 405a or 406a. Mr. NICHOLS. Lectures, two hours a week, to be arranged. *Baker* 207.

A discussion of selected topics in quantitative analysis, and the development and present status of various analytical methods. Given in alternate years. Not given in 1945-46.]

[250. *GAS AND FUEL ANALYSIS*. One term. Credit three hours. Prerequisite, Chemistry 220 and 221 or special permission. Mr. NICHOLS and assistants. Lecture, F 10. *Baker* 207. Laboratory, two laboratory periods a week, to be arranged. *Baker* 282.

The complete analysis of coal gas, flue gas, and air, the determination of the heating value of gaseous, liquid, and solid fuels; the analysis of coal; standard methods of testing various petroleum and coal-tar products; the analysis of various substances by methods involving the use of different types of gas evolution apparatus. Problems are assigned which afford practice in the calculation and interpretation of results. Not given in 1945-46.]

270. *SPECIAL METHODS OF QUANTITATIVE ANALYSIS*. One term. Credit three hours. Prerequisite, Chemistry 220 and 221 or special permission. Mr. NICHOLS and assistants. Lecture, T 11. *Baker* 207. Laboratory, S 8-1. *Baker* 282 and 294.

The complete analysis of coal gas, the analysis of coal, the determination of the heating value of gaseous and solid fuels, and gas evolution methods. The application of instrumental methods to quantitative analysis including nephelometric, refractometric, colorimetric, electrolytic, polariscopic, combustion, conductometric, and potentiometric methods.

275. *QUANTITATIVE MICROANALYSIS*. One term. Credit three or more hours. Prerequisite, Chemistry 230 or special permission, Mr. NICHOLS and assistant. Laboratory, W F 9-5. *Baker* 356.

Laboratory practice in typical methods of both organic and inorganic quantitative microanalysis.

280. *EMISSION SPECTROSCOPY IN CHEMICAL ANALYSIS*. One term. Credit three or more hours. Prerequisite, special permission. Mr. PAPISH and Mr. BAUER. Conference and laboratory, day and hours to be arranged. *Baker* 396.

The construction and use of spectroscopic equipment; spectrum excitation; qualitative and quantitative spectrochemical analysis.

295. *RESEARCH FOR SENIORS*. Two terms. Credit two or more hours. Messrs. BAUER, JONES, NICHOLS, and PAPISH.

ORGANIC CHEMISTRY

C 4 and 5. *INTRODUCTORY ORGANIC CHEMISTRY*. (*Navy Students only*.) Two terms. Credit four hours a term. Prerequisite, Navy Chemistry 1 and 2. Mr. RUSSELL and assistants. Lectures, T Th 9. *Baker* 107. Laboratory, T Th 1:40-4. *Baker* 250.

A study of the more important compounds of carbon, their occurrence, methods of preparation, their properties and reactions.

305a, 305b. *INTRODUCTORY ORGANIC CHEMISTRY*. Two terms. Credit three hours a term. Prerequisite, Chemistry 203 or 210. Open to those who are taking Chemistry 220 and 221. Mr. JOHNSON and Mr. BLOMQUIST. Lectures and written reviews, M W F 9. *Baker* 177 and 377.

A study of the more important compounds of carbon, their occurrence, methods of preparation, relations, and uses. Students who have completed Chemistry 375 may register for Chemistry 305b in the second term and receive two hours credit.

310a, 310b. *INTRODUCTORY ORGANIC CHEMISTRY*. Two terms. Credit three hours a term. Prerequisite or parallel course, Chemistry 305. Mr. RUSSELL and assistants. Laboratory practice and oral reviews, Chemistry 310a, T W Th 1:40-4. *Baker* 250. Chemistry 310b, F 1:30-4:30, S 8-12. *Baker* 250.

The student prepares a large number of typical compounds of carbon and familiarizes himself with their properties, reactions, and relations.

315a, 315b. *ADVANCED ORGANIC CHEMISTRY*. Two terms. Credit two hours a term. Prerequisite, Chemistry 305, 310, and 340, or the consent of the instructor. Mr. JOHNSON. Lectures, T Th 9. *Baker* 177.

First term, survey of the more important classes of organic compounds and their reactions. Second term, discussion of general topics (tautomerism, molecular rearrangements, stereochemistry). Students may register for either term separately.

320. *ADVANCED ORGANIC CHEMISTRY*. One term. Credit two to six hours. Prerequisite, Chemistry 305 and 310 (340 is desirable). Mr. RUSSELL and assistants. Laboratory, F 1:40-4, S 8-12 (other hours to be arranged). *Baker* 352.

An advanced course in the preparation of organic compounds. The original literature is consulted, and the student is required to repeat some

extended and important piece of work, and to compare his results with those published.

325a, 325b. *SPECIAL TOPICS IN ORGANIC CHEMISTRY*. Two terms. Credit two hours a term. Prerequisite, Chemistry 315 or 340. Primarily for graduate students; open to undergraduates by special permission. Mr. BLOMQUIST. Lectures, M W 11. *Baker* 377.

First term: free radicals, polymerization, newer synthetic methods, and special reagents. Second term, organic compounds of nitrogen and sulfur: heterocyclic compounds.

[330. *CHEMISTRY OF HIGH-POLYMERS*. One term. Credit two hours. Prerequisite, Chemistry 315 or 340 and 405 or 406. Mr. MILLER. Lectures, M W 11. *Baker* 177.

The mechanism of kinetics of polymerization processes and the chemical structure and reactions of high-polymers will be discussed, with examples chosen from the more significant natural and synthetic high molecular weight materials. Given in alternate years. Not given in 1945-46.]

335. *PHYSICAL ASPECTS OF ORGANIC CHEMISTRY*. One term. Credit two hours. Prerequisite, Chemistry 315 or 340; open to undergraduates only by special permission. Mr. MILLER. Lectures, M W 10. *Baker* 377.

340. *IDENTIFICATION OF ORGANIC COMPOUNDS*. One term. Credit three hours. Prerequisite, Chemistry 305 and 310 at grades of 75 or better. Mr. CAIN, Mr. MILLER, and assistants. Lectures, T Th 10. *Baker* 207. Laboratory, Two periods M T W or Th 1:40-4. *Baker* 350.

The classification reactions of organic compounds and the preparation of solid derivatives are applied to the identification of unknown organic substances.

345. *BIOCHEMICAL ASPECTS OF ORGANIC CHEMISTRY*. One term. Credit two hours. Prerequisite, Chemistry 315 or 340; open to undergraduates only by special permission. Mr. CAIN. Lecture, T Th 11. *Baker* 377.

A discussion of the organic chemistry of natural products, including plant and animal pigments, vitamins, hormones, etc.

375. *ELEMENTARY ORGANIC CHEMISTRY*. One term. Credit six hours. Prerequisite, general chemistry; qualitative analysis is desirable but not required. For students in the pre-medical and biological curricula. Mr. BLOMQUIST, Mr. CAIN, and assistants. Lectures, M W F S 11. *Baker* 207. Laboratory, M W 1:40-4 or T Th 1:40-4. *Baker* 250.

The student should determine the entrance requirement in organic chemistry for the particular medical school he wishes to enter. If more than six hours credit is required, he should register in Chemistry 305 and 310. Students may obtain 9 hours credit by taking Chemistry 305a and b (6 hours) and Chemistry 310a (3 hours). See Chemistry 305 announcement.

By special permission students may register for five hours credit, with only one laboratory period a week: Th 8-10:30.

395. *RESEARCH FOR SENIORS*. Two terms. Credit two or more hours. Students are advised to complete Chemistry 340 before registering in this course. Messrs. JOHNSON, BLOMQUIST, MILLER, CAIN, and RUSSELL.

PHYSICAL CHEMISTRY

405a, 405b. *INTRODUCTORY PHYSICAL CHEMISTRY*. Two terms. Credit three hours a term. Prerequisite, Chemistry 305a and b, Mathematics 60a, 60b, 60c, and 60d, and Physics 11 and 12 (or their substantial equivalent). Required of candidates for the degree of B.Chem.Eng. Mr. BRIGGS and assistants. Lectures, Chemistry 405a, M W F 11. *Baker* 7. Chemistry 405b, M W F 9. *Baker* 7.

A systematic presentation of the principles of physical chemistry. The topics include: the properties of gases, liquids, and solids; physical and chemical equilibrium in homogeneous and heterogeneous systems; the mass law, theorem of Le Chatelier, and the phase rule; thermochemistry and elementary thermodynamics; the theory of solutions; ionic equilibria; chemical kinetics; problems in physical chemistry.

406a, 406b. *PHYSICAL CHEMISTRY*. Two terms. Credit three hours a term. Prerequisite, Chemistry 305 a and b, which may be taken simultaneously; Mathematics 65a, 65b, and 65c or their equivalent; Physics 3 and 4, 7 and 8, or 11 and 12. Required of candidates for the degree of A.B. majoring in chemistry and open to other qualified students by permission. Mr. HOARD. Lectures, M W F 10, *Baker* 177.

A study of the more fundamental principles of physical chemistry from the standpoint of the laws of thermodynamics, and of the kinetic theory. A unified treatment of the properties of matter, thermochemistry, the properties of solutions, and of equilibrium in homogeneous and heterogeneous systems. Chemical kinetics and catalysis are included.

410a, 410b. *INTRODUCTORY PHYSICAL CHEMISTRY*. Two terms. Credit three hours a term. Prerequisite or parallel course, Chemistry 405 or 406. Mr. BRIGGS, Mr. HOARD, and assistants. Recitation, one hour a week, to be arranged. *Baker* 16. Laboratory, M T 1:40-4 or Th F 1:40-4. *Baker* 1.

Qualitative and quantitative experiments illustrating the principles of physical chemistry and practice in performing typical physico-chemical measurements. Recitations on the general principles of physical chemistry, based upon the lectures.

420. *ADVANCED PHYSICAL CHEMISTRY*. One term. Credit three hours. Prerequisite, Chemistry 405. Required of candidates for the degree of B.Chem.Eng. Mr. HOARD. Lectures and recitations, M W F 11. *Baker* 177.

Short course in chemical thermodynamics with applications to thermochemistry and physico-chemical equilibria. Emphasis on the solution of simple problems.

425. *APPLICATION OF THE PHASE RULE*. One term. Credit three hours. Prerequisite, Chemistry 405a and b or an elementary knowledge of the phase rule as applied to systems of one and two components. Mr. BRIGGS. Lectures, T Th S 10. *Baker* 7.

The study and interpretation of typical phase diagrams, especially in the systems of two and three components, followed by a brief treatment of systems containing four or more components. Special attention will be given to metal alloy diagrams, to equilibria in saturated salt solutions, and to the problem of indirect analysis.

430. *COLLOID CHEMISTRY*. One term. Credit three hours. Prerequisite, Chemistry 405 or 406. Mr. BRIGGS. Lectures, T Th S 10. *Baker 7*.

The properties of surfaces, including the adsorption of gases by solids, adsorption from solutions, liquid films, and contact catalysis. General properties of colloidal solutions and suspensions.

[435. *CHEMISTRY OF SOLIDS*. One term. Credit three hours. Prerequisite or parallel courses. Chemistry 405a and b or 406a and b, or special permission. Mr. HOARD and Mr. MASON. Lectures, Three hours a week, to be arranged. *Baker —*.

A general discussion of the formation and growth of metallic and chemical crystals, their physical and chemical behavior, and the relationships between lattice structure and chemical constitution. Not given in 1945-46.]

[440. *MOLECULAR SPECTRA*. One term. Credit three hours. Prerequisite, permission of the instructor. Mr. BAUER. Lectures, Three hours a week, to be arranged. *Baker 18*.

Brief review of atomic spectra. Description of the various types of molecular spectra; the rotation and vibration of diatomic molecules, electronic states and electronic transitions. A resume of continuous and diffuse molecular spectra with reference to the subject matter considered in photochemistry. Normal coordinate treatment of the vibrations of polyatomic molecules and the analysis of their Raman and infrared absorption spectra. Discussion of the relation between molecular structure and molecular constants. Not given in 1945-46.]

[445. *INTRODUCTORY ELECTROCHEMISTRY*. One term. Credit three hours. Prerequisite, Chemistry 405a and b or 406a and b. Mr. BRIGGS and assistant. Lectures, M W 12. *Baker 7*. Laboratory, Hours to be arranged following first lecture. *Baker 1A*.

Theory of electrolysis and of the voltaic cell, including theory and practice of electromotive force measurements, transference, ion activities, and oxidation-reduction. Not given in 1945-46.]

450. *APPLIED ELECTROCHEMISTRY*. One term. Credit three hours. Prerequisite, Chemistry 405a and b or 406a and b. Mr. BRIGGS. Lectures, T Th S 10. *Baker 7*.

Elementary theory of electrolysis and electromotive force. Electrolytic refining and extraction of metals: electroplating; electrolytic preparation of organic and inorganic compounds; electrothermal electrolysis; storage cells.

By electing Course 465 (one or more hours), the student may obtain laboratory practice in many of the subjects which are presented in the lectures.

[455. *KINETICS OF CHEMICAL REACTIONS*. One term. Credit two hours. Prerequisite, Chemistry 405a and b. Mr. LONG. Lectures, Two hours a week, to be arranged. *Baker 18*.

A general discussion of rates of reactions including: types of reactions, methods of measurement, theories of reaction rates, application to problems. Not given in 1945-46.]

460. *CHEMICAL PHYSICS*. One term. Credit three hours. Open to seniors and graduate students majoring in chemistry or physics. Mr. DEBYE. Lectures, M W F 10. *Baker* 207.

An elementary presentation of the principles involved in describing the structure and behavior of matter; atomic structure and the periodic table; inter-atomic forces; structure of solids; electrons in metals; temperature equilibrium and statistics.

465. *ADVANCED LABORATORY PRACTICE IN PHYSICAL CHEMISTRY*. One term. Credit variable, but not to exceed six hours a term. Prerequisite, determined in each case by the Professor in charge. Messrs. BRIGGS, KIRKWOOD, and HOARD. Laboratory, Day and hours, to be arranged.

470a, 470b. *THERMODYNAMICS*. Two terms. Credit three hours a term. Prerequisite, Chemistry 405a and b or 406a and b. Mr. KIRKWOOD. Lectures, M W F 9. *Baker* 107.

Development of the general equations of thermodynamics from the first and second laws. Exposition of the concepts of entropy and free energy. Applications to the study of physico-chemical equilibria in gases, liquids, solids, and liquid solutions. Problems.

[475. *THEORY OF SOLUTIONS*. One term. Credit three hours. Prerequisite, Chemistry 470a and b. Mr. KIRKWOOD. Lectures, M W F 12. *Baker* 18.

Exposition of modern theories of electrolyte and non-electrolyte solutions. Presentation of the Debye-Huckel theory and the calculation of the thermodynamic functions of electrolyte solutions from inter-ionic forces. The Bjerrum theory of ion association. Correlation of the properties of non-electrolyte solutions with molecular distribution and intermolecular forces. Discussion of transport phenomena in solution including electrolytic conductance, diffusion, and viscous flow. Not given in 1945-46.]

[480. *STATISTICAL MECHANICS*. One term. Credit three hours. Prerequisite, Chemistry 470a. Mr. KIRKWOOD. Lectures, M W F 12. *Baker* 18.

Exposition of the equilibrium theory of statistical mechanics from the standpoint of the Gibbs canonical ensemble. Mechanical interpretation of the principles of thermodynamics, with application to simple thermodynamic systems. Not given in 1945-46.]

490. *INTRODUCTORY QUANTUM MECHANICS WITH CHEMICAL APPLICATIONS*. One term. Credit three hours. Open to qualified students by permission. Mr. KIRKWOOD. Lectures, M W F 12. *Baker* 7.

Elementary presentation of the principles of quantum mechanics. The basic ideas underlying the quantum theory of the chemical bond.

495. *RESEARCH FOR SENIORS*. Two terms. Credit two or more hours. Messrs. BRIGGS, KIRKWOOD, and HOARD.

CHINESE

Mr. GERARD KOK and assistants.

1, 2. *INTENSIVE COURSE IN COLLOQUIAL CHINESE*. Two terms. Credit six hours a term. Mr. Kok and Chinese tutors. Three hours of instruc-

tion, three hours of tutorial work, and additional hours of supervised practice with phonograph records and mirrorphone.

This course will give mastery of pronunciation and grammar, a fair comprehension of spoken Chinese, a speaking vocabulary of 1200-1500 words, a reading knowledge of 600-800 characters, and a writing ability of 300-500 characters.

3. *INTENSIVE COURSE IN MODERN WRITTEN CHINESE*. Fall term. Six hours credit. Mr. Kok and Chinese tutors. Three hours of reading in advanced *baihua* selections and Modern Short Stories.

One hour of writing and composition, one hour of lecture in Chinese on geography and history of China, three hours of conversation.

This course will increase fluency and a comprehension of spoken Chinese. The student will learn to recognize an additional 800 characters and write 500 characters.

4. *INTENSIVE COURSE IN MODERN NEWSPAPER CHINESE*. Spring term. Six hours credit. Mr. Kok and Chinese tutors.

As above, except that newspaper reading will be substituted for the reading in Modern Chinese Short Stories. Results comparable with Chinese 3.

[11, 12. *INTRODUCTION TO CHINESE LITERATURE* (in translation). Two terms. Credit three hours a term.

A broadly cultural, rather than narrowly critical, study of Chinese literature. Not given in 1945-46.]

THE CLASSICS

Mr. HARRY CAPLAN, *Chairman*; Messrs. JAMES HUTTON, HORACE L. JONES, FRIEDRICH SOLMSEN, FREDERICK O. WAAGE, and RALPH L. WARD.

Those whose major study is in the Classics must complete twenty hours of non-starred courses in the Department, and fifteen hours, selected after conference with the adviser, in related subjects. Related subjects for this purpose are Ancient History, modern foreign languages, particularly French and German, and Ancient Philosophy.

ARCHAEOLOGY, ANCIENT ART

1a. *HISTORY OF PAINTING AND SCULPTURE*. Two terms. Credit three hours a term. Only the first term's work will count for credit in Classics.

HISTORY OF GREEK SCULPTURE. (See Fine Arts 2).

ART OF THE ROMAN EMPIRE. (See Fine Arts 3).

15. *NUMISMATICS: ANCIENT COINAGE*. Spring term. Hours to be arranged. *Goldwin Smith* 35. Mr. WAAGE. The permission of the instructor must be secured before registration.

GREEK

*1a. *GREEK FOR BEGINNERS*. Introduction to Homer's *Iliad*. Both terms. Credit three hours a term. M W F 12. *Goldwin Smith* 124. Mr. CAPLAN.

*1b. *HOMER'S ILIAD*. Continuation of Greek 1a. Both terms. Credit three hours a term. Prerequisite, Greek 1a. M W F 9. *Goldwin Smith* 120. Mr. SOLMSEN.

*2a. *ATTIC GREEK*. Xenophon, *Anabasis*; Plato, Selected Dialogues. Both terms. Credit three hours a term. Prerequisite, Greek 1b. T Th S 9. *Goldwin Smith* 120. Mr. WARD.

*2b. *EURIPIDES, IPHIGENIA IN TAURIS, AND ALCESTIS; NEW TESTAMENT, SELECTIONS*. Both terms. Credit three hours a term. Prerequisite, Greek 2a. T Th S 11. *Goldwin Smith* 120. Mr. JONES.

5. *GREEK COMPOSITION*. Throughout the year. Credit one hour a term. Prerequisite, Greek 1b or its equivalent. T 1:40. *Goldwin Smith* 128. Mr. JONES.

17. *ARISTOPHANES, CLOUDS; SOPHOCLES, OEDIPUS REX; HERODOTUS, HISTORIES*. Throughout the year. Credit three hours a term. Prerequisite, Greek 2a. T Th S 12. *Goldwin Smith* 125½. Mr. JONES.

20. *LYRIC POETRY; AESCHYLUS, PROMETHEUS BOUND; THEOCRITUS; DEMOSTHENES, PHILIPPIC ORATIONS*. Throughout the year. Credit three hours a term. Prerequisite, Greek 17. M W F 10. *Goldwin Smith* 124. Mr. CAPLAN.

25. *ADVANCED GREEK COMPOSITION*. Throughout the year. Credit one hour a term. Prerequisite, Greek 5. Th 1:40. *Goldwin Smith* 128. Mr. WARD.

LATIN

*1a. *FRESHMAN COURSE*: For Students Offering Three Units of Entrance Latin. Throughout the year. Credit three hours a term. Virgil; Horace, Odes and Epodes. Section 1: M W F 10. *Goldwin Smith* 120. Mr. SOLMSEN. Section 2: T Th S 10. *Goldwin Smith* 128. Fall term, Mr. WARD; spring term, Mr. HUTTON.

*1. *FRESHMAN COURSE*: For Students Offering Four Units of Entrance Latin. Throughout the year. Credit three hours a term. Cicero, *De Senectute*; Horace, Odes and Epodes. M W F 11. *Goldwin Smith* 124. Mr. CAPLAN.

*4. *LATIN LANGUAGE REVIEW*. For freshmen. Throughout the year. Credit one hour a term. Th 12. *Goldwin Smith* 128. Mr. WARD.

*8. *TERENCE, ANDRIA; CATULLUS; HORACE, SATIRES AND EPISTLES; VIRGIL, GEORGICS; LIVY*. Throughout the year. Credit three hours a term. Prerequisite, Latin 1a or 1. M W F 11. *Goldwin Smith* 120. Fall term, Mr. WARD; spring term, Mr. SOLMSEN.

12. *CICERO'S LETTERS*. Spring term only. Credit two hours. Open to those who have taken or are taking Latin 8 or 17. M W 12. *Goldwin Smith* 120. Mr. WARD.

17. *LITERATURE OF THE EARLY EMPIRE*. Throughout the year. Credit three hours a term. Prerequisite, Latin 8. Tacitus, *Annals*; Juvenal; Pliny's *Letters*; Suetonius; Seneca's *Letters*. T Th S 9. *Goldwin Smith* 124. Fall term, Mr. SOLMSEN; spring term, Mr. HUTTON.

21. *LATIN WRITING*. Throughout the year. Credit one hour a term. Prerequisite, Latin 1 or 1a. W 1:40. *Goldwin Smith* 124. Mr. WARD.

40. *SEMINARY COURSE: Roman Elegy*. Throughout the year. Open to graduate students. T 2. *University Library*, Classical Seminary Room. Mr. SOLMSEN.

45. *LATIN WRITING, Advanced Course*. Throughout the year. Credit one hour a term. For graduates and for undergraduates who have taken Latin 21. M 1:40. *Goldwin Smith* 124. Mr. WARD.

47. *HISTORY OF THE LATIN LANGUAGE*. Spring term. Credit two hours. Primarily for graduates. T Th 12. *Goldwin Smith* 120. Mr. WARD.

CLASSICS

Open to students who have no knowledge of Latin or Greek

10. *ENGLISH TRANSLATIONS OF GREEK AND LATIN CLASSICS*. Throughout the year. Credit three hours a term. Open to sophomores and upperclassmen. T Th 11 and an hour to be arranged. *Goldwin Smith* 124. Fall term, Mr. CAPLAN; spring term, Mr. HUTTON.

Rapid reading in the best translations, with emphasis upon Greek masterpieces; for example, the *Iliad* and the *Odyssey*, the tragedies of Sophocles, and several dialogues of Plato. Translations from the Latin will be chosen for the bearing of the original works upon modern literature.

15. *FOUNDATIONS OF WESTERN THOUGHT*. Fall term only. Credit three hours. Open to sophomores and upperclassmen. M W F 12. *Goldwin Smith* 120. Mr. SOLMSEN.

A study of the beliefs and ideas—religious, moral, social, and scientific—which were current or advanced in the Greek, Roman, and Early Christian period of Western Civilization; the history and transformation of these ideas and their integration into coherent bodies of thought. Popular thought and practices as well as the ideas of leading thinkers, and poets will be considered. Reading of representative material in translation. Two hours will be given to lectures, one hour to discussion of the ideas treated. Attention will be given to their influence on later thought and their relevance to present-day problems.

ECONOMICS

Mr. P. M. O'LEARY, *Chairman*; MESSRS. DONALD ENGLISH, M. S. KENDRICK, R. E. MONTGOMERY, H. L. REED, and JOHN B. HUTCHINS.

For a major in Economics the following courses must be completed: (1) in Economics, course 1, or 2a and 2b, or the equivalent; twenty hours of advanced courses; (2) in related subjects, fifteen hours in the following departments: (a) History (in addition to the six hours in Prescribed Subjects); (b) Government (except courses 1-7);

(c) *Sociology* (as approved by adviser); (d) *Philosophy* 3, 4, 5, 10; (e) *Mathematics* (Calculus, courses prerequisite to Calculus provided a course in calculus is included); (f) *Geology* 200, 202.

Students who intend to register in Arts and Sciences and in the Law School will be required to complete twelve hours of advanced courses in Economics and nine hours of related courses.

Students beginning to major in 1945 may elect the special major in Business Administration consisting of 42 hours of courses as follows: Economics 11, 21a and 21b, 28a and 28b, 31, 41, Engineering 3A41 and 3A45; and twelve hours from the following: Economics 12, 15, 42, Advanced Accounting (3 hours), Cost Accounting (3 hours), Security Analysis (3 hours). The last three courses will not be offered until 1946-47.

*1. *MODERN ECONOMIC SOCIETY*. One term. Given only in the spring term. Credit five hours. Not open to freshmen.

A survey of the existing economic order, its more salient and basic characteristics, and its operation.

*2a. *MODERN ECONOMIC SOCIETY*. Fall term. Credit three hours. Not open to freshmen. M W F 9 and 11, T Th S 9 and 11. Goldwin Smith 264. This course and course 2b cover the same subject matter as course 1.

*2b. *MODERN ECONOMIC SOCIETY*. Spring term. Credit three hours. Prerequisite, course 2a.

*3. *INTRODUCTION TO ECONOMICS*. For students in Engineering and Chemistry. Repeated in the spring term. Credit three hours. Mr. KENDRICK. M W F 9. Goldwin Smith 242.

An introduction to the more essential economic features of contemporary American Society.

11. *MONEY, CURRENCY, AND BANKING*. Fall term. Credit three hours. Prerequisite, Economics 1 or its equivalent. Mr. REED. M W F 9. Goldwin Smith 256.

An introductory study of the history and theory of money, currency, and bank credit. Enrollment limited.

12. *COMMERCIAL BANKING*. Spring term. Credit three hours. Prerequisite, Economics 11. Mr. REED. Hours to be announced. Problems of bank administration.

15. *TRADE FLUCTUATIONS*. Fall term. Credit three hours. Prerequisite, Economics 11 or consent of the instructor. Mr. REED. T Th S 11. Goldwin Smith 256.

A study of the causes and effects of trade recessions and revivals, with an introduction to the methods of general forecasting.

21a. *ACCOUNTING*. Both terms. Credit three hours. Prerequisite, Economics 1 or its equivalent. May, with permission of instructor, be taken by students registered for course 2b. Mr. ENGLISH. T Th 9 and Th 1:40-4. Goldwin Smith 256.

Theory of debit and credit; the journal and ledger; the development of books of original entry; preparation of income statements and balance sheets.

21b. *ACCOUNTING*. Both terms, but will be given in fall term only if twelve or more students register. Credit three hours. Prerequisite, Economics 21a. Mr. ENGLISH. T Th S 10. *Goldwin Smith* 256.

Capital stock accounts; bonds and their valuation; amortization, reserves and reserve funds, analysis of income statements and balance sheets.

ELEMENTARY BUSINESS AND INDUSTRIAL STATISTICS (Engineering 3A41). Fall term. Credit three hours. Prerequisite, Economics 1 or its equivalent. Mr. GARRETT. T Th 8 and F 1:40-4. *West Sibley*.

The elementary techniques of statistical analysis as applied in business and industry.

PROBLEMS IN BUSINESS AND INDUSTRIAL STATISTICS (Engineering 3A55). Spring term. Credit three hours. Prerequisite, Engineering 3A41 or its equivalent. Mr. GARRETT. T Th 8 and F 1:40-4. *West Sibley*.

Certain principles, methods, and problems are studied which can not receive adequate treatment in the elementary three-hour course.

28a. *BUSINESS LAW AND PROBLEMS*. Fall term. Credit three hours. Prerequisite, Economics 1 or its equivalent. Mr. WHITESIDE and Mr. MACDONALD. M W F 11. *Myron Taylor Hall*, Room A.

The fundamentals of the law as applied to business transactions; government regulation of business and industry; lectures, reports, and problems.

28b. *BUSINESS LAW AND PROBLEMS*. Spring term. Credit three hours. Prerequisite, Economics 28a. Mr. WHITESIDE and Mr. MACDONALD. M W F 11. *Myron Taylor Hall*, Room A.

A continuation of Economics 28a.

31. *CORPORATION FINANCE*. Spring term. Credit three hours. Prerequisite, Economics 21a or its equivalent. Mr. O'LEARY. M W F 9. *Goldwin Smith* 256.

A study of the financial practices of business corporations in the United States; types of corporate securities; sources of capital funds; determination and administration of corporate incomes; financial difficulties and corporate reorganizations; the relation of corporate practices to the functioning of the American economic system; and the regulatory activities of the Securities and Exchange Commission.

TAXATION (Agricultural Economics 138). Spring term. Credit three hours. Open to juniors and seniors who have credit for Economics 1 or its equivalent. Mr. KENDRICK. Hours to be announced.

A study of the principles and practices of public finance, with emphasis on taxation. Among the topics examined are: the growth of public expenditures; the changing pattern of federal, state, and local taxation; the incidence of taxation; and the problem of war finance.

41. *LABOR CONDITIONS AND PROBLEMS*. Fall term. Credit three hours. Prerequisite, Economics 1 or its equivalent. Mr. MONTGOMERY. T Th S 10. *Goldwin Smith* 264.

An introduction to the field of Labor Economics and a survey of the more basic labor problems growing out of modern economic arrangements.

42. *TRADE UNIONISM AND COLLECTIVE BARGAINING*. Spring term. Credit three hours. Prerequisite, Economics 41 or the consent of the instructor. Mr. MONTGOMERY. T Th S 10, *Goldwin Smith* 264.

A study of the origins, philosophic basis, aims, and policies of trade unions, of the economic implications of trade unionism in modern economic life, and of collective bargaining in selected industries.

46. *LEGAL AND CONSTITUTIONAL ASPECTS OF LABOR PROBLEMS AND SOCIAL INSURANCE*. Fall term. Credit two hours. Consult the instructor before registering. Mr. MONTGOMERY. T 2-4.

A study of the legal aspects of trade union objectives and methods and types of social insurance. Among the topics treated: legal theories underlying labor law; statutory enactments affecting trade unions; injunctions, damage suits, criminal prosecutions, restrictions upon employers; conciliation, arbitration, mediation, unemployment insurance, health insurance, workmen's compensation, old age pensions, the legal minimum wage.

82. *ECONOMIC ANALYSIS*. Fall term. Credit three hours. Prerequisite, Economics 1 or its equivalent. Mr. KENDRICK. M W F 10. *Goldwin Smith* 256.

A study of the processes of price formation and the determination of the incomes of the factors of production under differing market situations.

ENGLISH

Mr. G. H. SABINE, *Acting Chairman*; Messrs. R. C. BALD, C. W. DUNN, R. H. ELIAS, F. B. FREEMAN, W. H. FRENCH, W. B. GRAGG, W. R. IRWIN, C. W. JONES, WALTER MACKELLAR, H. A. MYERS, EDWIN NUNGEZER, J. D. OGDEN, H. F. POMMER, W. M. SALE, JR., J. C. SHERWOOD, R. P. SIBLEY, E. J. SIMMONS, MRS. MARGARET R. STOBIE, Messrs. W. G. STOBIE, H. W. THOMPSON, CHARLES WEIR, JR., PAUL WELSH, and M. H. ABRAMS.

For major work in English the student is required to complete (1) six hours of English 2 (or its equivalent); (2) English 25a and 25b, normally to be taken in the sophomore year; (3) twenty-four hours of other courses; and (4) eighteen hours in related subjects.

The choice of these courses is subject to the following restrictions:

(a) A student must complete a minimum of three hours' work in each of Groups I, II, III, and IV; and so plan his program that he will have completed a total of nine hours' work in one period and nine hours' work in one form or type of literature. Courses used to satisfy the requirement in a period may not be used to satisfy the requirement in a form, and vice versa.

The periods and forms are set forth below:

Periods

1. English literature before 1800 (Courses 25a, 31, 32, 34a, 34b, 45, 56, 60, 63, 81)
2. English literature after 1800 (Courses 25b, 35a, 35b, 36a, 36b, 37, 40a, 53)
3. American literature (Courses 39, 40b, 41, 54, 58, 78a, 78b)

Forms

1. Poetry (Courses 35a, 35b, 36b, 53, 54, 60, 63)
2. Drama (Courses 23, 45, 48, 61)
3. Prose fiction (Courses 26, 40a, 40b, 41, 44, 78b)
4. Prose, critical and reflective (Courses 21, 36a, 55, 78a)

(b) *The eighteen hours in related courses must be chosen from the Classics, Speech and Drama, Philosophy, Music, the Fine Arts, or History, and the Modern Languages (after the College requirements are satisfied). In general, the student will be expected to complete twelve of these hours in one department. The Department of English strongly recommends that students who intend to choose English as their major subject take English History in their first or second year.*

Prospective teachers of English should elect a special sequence of required courses to satisfy the major requirements. For particulars, consult Mr. Hulse of the Department of Education.

A student desiring to become a candidate for Honors in English should consult Mr. Sale concerning the requirements not later than the end of his junior year, and preferably earlier.

FOR FRESHMEN

*2a, 2b. **INTRODUCTORY COURSE IN READING AND WRITING.** Two terms. Credit three hours a term. Both 2a and 2b will be offered in each term, but 2a is a prerequisite of 2b. M W F 8, 9, 10, 11, 12; T Th S 8, 9, 10, 11. Rooms to be announced.

The aim of this course is to increase the student's ability to communicate his own thought and to understand the thought of others. Assignment to sections will be made in *Barton Hall*. Mr. SALE is in charge of the course.

Freshmen may substitute for English 2 the interdepartmental course, Oral and Written Expression, described on p. 91.

*4. **ENGLISH FOR FOREIGNERS.** Two terms. Credit three hours a term. T Th S 12. *Goldwin Smith* 160. Mr. THOMAS.

Upon recommendation of his college, a student may take this course in lieu of English 2a and 2b.

10. **INTRODUCTORY COURSE IN LITERATURE.** Two terms. Credit three hours a term. M W F 12; M W F 1:40. Rooms to be announced on registration.

For freshmen in the College of Arts and Sciences. This course may be taken in addition to English 2a and b. Since registration must be limited to forty, students may register for it only after consultation with Mr. SALE in *Barton Hall*. Selected works of a limited number of significant English and American authors will be studied.

FOR SOPHOMORES AND UPPERCLASSMEN

Note: Courses preceded by an asterisk are intended primarily for underclassmen (see first courses listed in groups I, II, III). Students of junior or senior standing may not offer them in satisfaction of the twenty-four hours of advanced work; except that English 20 and 21 may be offered if approved by the adviser. Courses preceded by

a dagger are intended for upperclassmen and may be elected by underclassmen only with the consent of the instructor.

All other courses are strictly limited to upperclassmen.

GROUP I

Courses in composition, criticism, and in the history and early literature of the language.

*20. *PROSE AND COMPOSITION*. Given in both terms. Credit three hours. Sections for each term will be listed in the Supplementary Announcement.

A course in writing open to those who have received credit for both terms of English 2, or the equivalent. Twenty periods will be devoted to the criticism of themes and to the study of special topics in composition; the rest of the time to reading good prose, frequent practice in writing, and personal conferences.

*21. *PROSE AND COMPOSITION*. Spring term. Credit three hours. Sections will be listed in the Supplementary Announcement.

A continuation of English 20, which is prerequisite. Twenty periods will be devoted to the study of usage, the sentence, effective wording, and types of writing; the rest of the time to reading good prose, frequent practice in composition, and personal conferences.

81. *OLD ENGLISH PROSE AND POETRY*. Two terms. Credit three hours a term. M W F 2. *Goldwin Smith* 160. Mrs. STOBIE.

A survey of English literature from 750 to 1150, with special attention to the language, the literary forms, and the prosody.

82. *INTRODUCTION TO THE STUDY OF LANGUAGE*. Fall term. Credit three hours. T Th S 10. *Goldwin Smith* 162. Mr. DUNN.

For students of literature, languages, or social science. A survey of the principal theories concerning the development and structure of languages. Knowledge of a language other than English is not required.

84. *ADVANCED COMPOSITION*. Two terms. Credit three hours a term. T Th 11 and conferences. *Goldwin Smith* 245. Mr. WEIR.

A course in writing devoted chiefly to prose narrative. The instructor must be consulted before registration.

89. *MODERN LITERARY CRITICISM*. Spring term. Credit three hours. M W F 10. *Goldwin Smith* 245. Mr. SALE.

A study of certain modern critical opinions and their bearing on the practice of literary criticism. Considerable writing of a critical nature will accompany the study. The instructor must be consulted before registration.

GROUP II

Courses in periods, emphasizing important themes, interests, and forms.

*25a, 25b. *GREAT ENGLISH WRITERS*. Two terms. Credit three hours a term. M W F 11. Rooms to be announced on registration for the course in *Barton Hall*. Messrs. ABRAMS, SALE, and WEIR.

Studies in selected works of about twelve of the more important authors from Chaucer to the present.

[31. *MEDIEVAL LITERATURE*. Not given in 1945-46.]

32. *THE ENGLISH RENAISSANCE*. Spring term. Credit three hours. M W F 9. *Goldwin Smith* 160. Mr. NUNGEZER.

Studies in the non-dramatic literature of the predecessors and contemporaries of Shakespeare.

[†34a. *EIGHTEENTH CENTURY LITERATURE: SWIFT, POPE, AND THEIR CONTEMPORARIES*. Not given in 1945-46.]

†34b. *EIGHTEENTH CENTURY LITERATURE: THE AGE OF JOHNSON AND BURNS*. Spring term. Credit three hours. M W F 11. *Goldwin Smith* 156. Mr. THOMPSON.

A course concerned with the literature of the latter half of the century.

35a. *THE ROMANTIC REVIVAL: THE AGE OF WORDSWORTH*. Fall term. Credit three hours. T Th S 9. *Goldwin Smith* 156. Mr. BALD.

Studies in Wordsworth, Coleridge, Hazlitt, and Lamb.

[35b. *THE ROMANTIC REVIVAL: THE AGE OF BYRON*. Not given in 1945-46.]

36a. *THE VICTORIAN AGE*. Fall term. Credit three hours. M W F 12. *Goldwin Smith* 156. Mr. FRENCH.

A study of the main currents and masterpieces in prose. This course may not be elected by those who have, or expect to have, credit for English 21,

[36b. *THE VICTORIAN AGE*. Not given in 1945-46.]

37. *TWENTIETH CENTURY ENGLISH LITERATURE*. Spring term. Credit three hours. M W F 12. *Goldwin Smith* 156. Mr. WEIR.

The literature of the past forty years will be studied primarily as a reflection of currents in English thought and life.

†39. *AMERICAN LITERATURE*. Two terms. Credit three hours a term. M W F 9. *Goldwin Smith* B. Mr. THOMPSON.

Fall term: Colonial days to the Civil War; Spring term: from 1865 to the present.

GROUP III

Courses in important types and forms of literature.

*23. *INTRODUCTION TO THE DRAMA*. Fall term. Credit three hours. T Th S 10. *Goldwin Smith* B. Mr. MACKELLAR.

An introduction to the drama as a form of literature, and to the distinguishing qualities of tragedy, comedy, melodrama, and farce. Reading of fifteen representative classical and modern plays.

*26. *INTRODUCTION TO PROSE FICTION*. Spring term. Credit three hours. T Th S 10. *Goldwin Smith* B. Mr. WEIR.

A study of representative types of the novel.

[†40a. *THE MODERN ENGLISH NOVEL*. Not given in 1945-46.]

†40b. *THE MODERN AMERICAN NOVEL*. Fall term. Credit three hours. M W F 10. *Goldwin Smith* 156. Mr. SALE.

A critical study of American fiction, beginning with Mark Twain.

[41. *AMERICAN PROSE FICTION BEFORE 1850*. Not given in 1945-46.]

44. *EUROPEAN FICTION*. Two terms. Credit three hours a term. M W F 12. *Goldwin Smith* C. Mr. SIMMONS.

Lectures and reading. Selected English, French, German, and Russian novels of the eighteenth and nineteenth century will be read. Special attention will be paid to the transmission of ideas and the development of trends in European fiction. All foreign novels will be read in English translation.

45. *THE ENGLISH DRAMA TO 1642*. Fall term. Credit three hours. M W F 9. *Goldwin Smith* 160. Mr. BALD.

Studies in the plays of the contemporaries of Shakespeare.

[48. *MODERN DRAMA*. Not given in 1945-46.]

AMERICAN DRAMA AND THEATRE (Speech and Drama 48b).

[50. *LITERATURE AND SOCIETY*. Not given in 1945-46.]

[53. *RECENT ENGLISH POETRY*. Not given in 1945-46.]

[54. *RECENT AMERICAN POETRY*. Not given in 1945-46.]

[56. *MIDDLE ENGLISH METRICAL ROMANCES*. Not given in 1945-46.]

†58. *AMERICAN FOLK-LITERATURE*. Fall term. Credit three hours. T Th S 9. *Goldwin Smith*, Museum of Casts. Mr. THOMPSON.

Backgrounds of American Literature and life revealed in traditional tales, ballads, proverbs, games, customs, and place-names. Emphasis upon ballads, and upon methods of collecting and classifying folklore.

GROUP IV

Courses presenting a considerable body of the work of major figures in English and American Literature.

60. *CHAUCER AND HIS AGE*. Two terms. Credit three hours a term. M W F 10. *Goldwin Smith* 160. Mr. FRENCH.

First term: Chaucer's life; his contemporaries; *Troilus and Criseyde*; the minor poems; second term: *The Canterbury Tales* and Chaucer's successors in the fifteenth century.

61. *SHAKESPEARE*. Two terms. Credit three hours a term. M W F 11. *Goldwin Smith* 156. Fall term, Mr. BALD; spring term, Mr. MAC KELLAR.

Fall term: a study of the tragedies of Shakespeare. Spring term: a study of representative histories and comedies.

63. *MILTON*. Fall term. Credit three hours. T Th S 11. *Goldwin Smith* 156. Mr. MAC KELLAR.

A study of Milton's poetry, chiefly *Paradise Lost*, and of selections from his prose works.

[78a. *EMERSON, THOREAU, AND WHITMAN*. Spring term. TTHS9. *Goldwin Smith* 156. Mr. MYERS.

Prerequisite, English 39. An intensive study of these American classics with special attention to transcendentalism and prophecy. Not given in 1945-46.]

78b. *THREE AMERICAN NOVELISTS: HAWTHORNE, MELVILLE, AND JAMES*. Spring term. T Th S 10. *Goldwin Smith* 128. Mr. FREEMAN. Prerequisite, English 39 or consent of the instructor.

THE FINE ARTS

Mr. F. O. WAAGE, *Chairman*; Mr. D. L. FINLAYSON.

Students who wish to do their major work in the Fine Arts will choose one of these three options:

1. *General Course*. For major work in this option the following courses must be completed: (1) nine hours in Aesthetics, namely Philosophy 8a, 8b, and 19. (2) (a) Music, two approved courses; (b) nine hours in the History of Architecture, Painting, and Sculpture; (c) nine hours of literature, to be elected from approved courses in Classics, English, German, Speech and Drama, and Romance Languages. (3) Twelve hours of approved advanced courses in one of three fields: (a) Literature (literary history, criticism, writing, and dramatics); (b) Art and Architecture (history, composition, and design); (c) Music (theory, composition, and application).

2. *History of Art*. For a major in the History of Art 1a, 1b, 10a, 10b and eighteen other hours in the History of Art must be completed. In addition, there must be completed fifteen hours of related courses, including Philosophy 8a and 8b.

3. *History and Practice of Art*. For a major in this option the student will include in his course of study thirty hours in courses offered by the College of Architecture in the practice of art. The major work of this option will be in the history of art. Students who elect this option will be admitted to the Graduate School as candidates for the degree Master of Fine Arts with a program in the practice of art which may be completed in two years of graduate study.

The courses which follow are those offered by the Department of Fine Arts, together with certain courses open to students of this College in the College of Architecture.

The courses listed from the College of Architecture may not be counted in the ninety hours required in the College of Arts and Sciences.

GENERAL

[*AESTHETICS: PSYCHOLOGY OF ART* (Psychology 8a). Not given in 1945-46.]

AESTHETICS: PHILOSOPHY OF ART (Philosophy 8b).

HISTORY OF ART

1a. *HISTORY OF PAINTING AND SCULPTURE: ANCIENT AND MEDIEVAL*. Fall term. Credit three hours. M W F 2; T 12 and 2, Th 12. *Goldwin Smith*, Museum of Casts. Mr. WAAGE.

1b. *HISTORY OF PAINTING AND SCULPTURE: RENAISSANCE AND MODERN*. Spring term. Credit three hours. M W F 2. *White 201*. T 12 and 2, Th 12. *Goldwin Smith*, Museum of Casts. Messrs. FINLAYSON and WAAGE.

2. *HISTORY OF GREEK SCULPTURE*. Fall term. Credit three hours. M W F 10. *Goldwin Smith 35*. Mr. WAAGE.

3. *ART OF THE ROMAN EMPIRE*. Spring term. Credit three hours. M W F 10. *Goldwin Smith 35*. Mr. WAAGE.

After a sketch of Etruscan and Republican art, the evolution of Hellenistic sculpture and painting will be traced through the Empire to the sixth century. A few lectures will be devoted to the minor arts.

4. *PRIMITIVE ART: THE ART OF EARLY SOCIETIES*. Spring term. Credit three hours. M W F 12. *Goldwin Smith 35*. Mr. WAAGE.

The study of the relation between culture and art in early societies where sculpture and painting were indispensable elements in everyday life; the shaping and use of art forms to satisfy the group needs of the cultures of Old Stone Age Europe, ancient Egypt, Africa, Australia, and Central and South America (Mayan, Aztec, and Incan cultures), with some consideration of the influence of these primitive and archaic forms on modern art.

[5. *RENAISSANCE AND MODERN SCULPTURE*. Fall term. Credit three hours. Not given in 1945-46.]

A study of the evolution of sculpture in Europe and America, and of the changes in taste from the fifteenth century to the present day, by means of an analysis of the works of representative sculptors and the use, where necessary, of parallels in painting and architecture.

[6. *ITALIAN PAINTING OF THE RENAISSANCE*. Spring term. Credit three hours. Not given in 1945-46.]

The history of painting in the principal centers of Italy. Among the major figures whose lives and works will be studied are Giotto, Fra Angelico, Massaccio, Botticelli, the Bellinis, Leonardo, Giorgione, Titian, Michelangelo, Tintoretto.

[8. *INTRODUCTION TO CHINESE AND JAPANESE ART*. Spring term. Credit three hours. Not given in 1945-46.]

Chinese art, in its more important media, from the Bronze Age to the Manchu dynasty. Some account is taken of the influences of Buddhist India and the West. The art of Japan is viewed both in its relation to that of China and in its more independent aspects.

9. *THE METHODS AND MATERIALS OF THE ART OF PAINTING*. See Announcement of the College of Architecture.

A survey of the styles of painting as they have been affected by the materials and techniques of the various epochs. Lectures and readings are

supplemented by studio work in which the student executes designs in mosaic, egg tempera, fresco, and the various methods of oil painting. Previous experience in drawing is not required.

[10a. *HISTORY OF ARCHITECTURE: ANCIENT AND MEDIEVAL*. Fall term. Credit three hours. Open to freshmen with the permission of the instructor. Not given in 1945-46.]

[10b. *HISTORY OF ARCHITECTURE: RENAISSANCE AND MODERN*. Second term. Credit three hours. Not given in 1945-46.]

11. *AMERICAN PAINTING*. Fall term. Credit three hours. M W F 12. *Goldwin Smith*, Museum of Casts. Mr. FINLAYSON.
Painting in the United States from colonial days to the present.

15. *NUMISMATICS: ANCIENT COINAGE*. Spring term. Hours to be arranged. *Goldwin Smith* 35. Mr. WAAGE. The permission of the instructor must be secured before registration.

The coins will be treated as material for the study of the history of the Mediterranean states from the sixth century B. C. to the Byzantine Empire, with reference to the politics, economics, and art of the period. The students will work with coins from the University collection.

26a. *SEVENTEENTH AND EIGHTEENTH CENTURY PAINTING*. Fall term. Credit three hours. M W F 11. *White* 201. Mr. FINLAYSON.
Painting of the Baroque and Rococo periods in the major European countries. Given in alternate years.

26b. *MODERN PAINTING*. Spring term. Credit three hours. M W F 11. *White* 201. Mr. FINLAYSON.
Nineteenth century painting in France, England, and Germany, and the major movements in twentieth century painting. Given in alternate years.

[28a. *ROMANESQUE AND GOTHIC SCULPTURE*. Fall term. Credit three hours. M W F 11. *White* 201. Mr. FINLAYSON. Not given in 1945-46.]
Sculpture in the major European countries from 1000 A. D. through the Gothic period. Given in alternate years.

[28b. *GOTHIC PAINTING*. Spring term. Credit three hours. M W F 11. *White* 201. Mr. FINLAYSON. Not given in 1945-46.]
Painting in Italy in the fourteenth century, and in France, Germany, and the Netherlands in the fourteenth and fifteenth centuries. Given in alternate years.

29, 30. *HISTORICAL SEMINAR IN PAINTING AND SCULPTURE*. Both terms. Credit three hours a term. Registration limited. Hours to be arranged. Mr. FINLAYSON. Open to graduate students and qualified undergraduates. Twelve hours of the History of Art or their equivalent are prerequisite. Students wishing to elect this course must secure the permission of the instructor.

COURSES IN THE COLLEGE OF ARCHITECTURE

Open to election by students in the College of Arts and Sciences.
May not be counted in the ninety required hours of Arts courses.

History of Architecture

ANCIENT ARCHITECTURE (Architecture 410). One term. Credit three hours.

Egyptian, Western Asiatic, Greek, Roman, and Early Christian architecture.

MEDIEVAL ARCHITECTURE (Architecture 411). One term. Credit four hours. Prerequisite, Architecture 410.

Byzantine, Mohammedan, Romanesque, and Gothic architecture.

RENAISSANCE ARCHITECTURE (Architecture 412). One term. Credit four hours. Prerequisite, course 411.

Architecture of the Renaissance in the principal European countries.

AMERICAN AND CONTEMPORARY ARCHITECTURE (Architecture 413). One term. Credit three hours. Prerequisite, Architecture 412.

The architecture of the United States in the seventeenth and eighteenth centuries and of Europe and the United States from 1800 to the present.

Composition

These courses consist of the study and application of the underlying principles of Composition. They are presented by means of series of problems in pictorial and decorative design in line, tone, and color, or in sculptural groups. Special study is made of design appropriate to architectural settings for contemporary use. Collaborative problems are given from time to time which require the combined efforts of painter, sculptor, architect, and landscape architect. Criticism periods in all courses in composition are held Tuesday and Thursday afternoons, 1:40-4; other periods will be arranged.

In Courses 300 to 304 the number of credit hours a term is based upon one credit hour per laboratory period of two and one-half hours. Credit hours to be arranged upon registration in consultation with instructor in charge.

ELEMENTARY COMPOSITION (Architecture 300). Two terms. Credit three hours each term.

INTERMEDIATE COMPOSITION (Architecture 301). Two terms. Credit four to six hours each term as arranged.

ADVANCED COMPOSITION (Architecture 304). Two terms. Credit four to six hours each term as arranged.

Drawing and Painting

This sequence of courses deals with the study of form and its representation by means of line, tone, and color. Emphasis is given to the drawing and painting of forms in their spatial relationships. Geometric objects, casts, and still-life and landscape materials

are used in the first year's work. In the intermediate and advanced courses, studies of the nude and draped model and of portraiture are added.

In courses 311 and 314 the number of credit hours per term is based upon one credit hour per laboratory period of two and a half hours. Credit hours to be arranged upon registration in consultation with instructor in charge.

ELEMENTARY DRAWING AND PAINTING (Architecture 309). Both terms. Credit three hours a term. M 2. W F 1:40-4. Franklin. Mr. DALY.

The beginning course for all students except architects and landscape architects. An introduction to the principles and methods of decorative and pictorial design and of representational drawing and painting, using various media. The principles of color harmony and of the pictorial use of color. Discussion of historical and contemporary examples, lectures, readings, examinations, and analytical and creative exercises in the studio.

INTERMEDIATE DRAWING AND PAINTING (Architecture 311). Two terms. Credit three to six hours each term as arranged.

ADVANCED DRAWING AND PAINTING (Architecture 314). Two terms. Credit four to ten hours each term as arranged.

Sculpture

The courses in modeling begin with a study of the basic relationships of forms to voids. Architectural ornament and the human figure are studied from casts. Beginning in the second year, nude and costumed models are used. Portraiture is studied. The work closely parallels that in Composition. Studies made in these modeling courses may be used as material for problems in Composition. Instruction is given in casting in plaster, in direct carving, and in the use of the pointing machine.

In courses 331 and 333 the number of credit hours per term is based upon one credit hour per laboratory period of two and a half hours. Credit hours to be arranged upon registration in consultation with instructor in charge.

ELEMENTARY SCULPTURE (Architecture 330). Two terms. Credit two to four hours each term as arranged. Prerequisite, Architecture 310.

INTERMEDIATE SCULPTURE (Architecture 331). Two terms. Credit three to six hours each term as arranged.

ADVANCED SCULPTURE (Architecture 333). Two terms. Credit four to ten hours each term as arranged.

GEOLOGY

Mr. O. D. VON ENGELN, *Chairman*; Messrs. A. L. ANDERSON, J. D. BURFOOT, JR., C. M. NEVIN, W. STORRS COLE, and ———.

Those who are planning a career in geology or will seek the recommendation of the department for continuation of their studies in graduate work must complete the

following courses for a major: *Geology A*, 102, 103, 107, 200, 205, 311, 317, either 318 or 319, 402, 403, 500. In related subjects, fifteen hours, which should include *Chemistry* 102 or 104; *Mathematics* 15; *Physics* 3, 4, or 3, 6; and a selection from the following: *Astronomy* 180, 181; *Meteorology* 1, 2; *Zoology* 1, 16; *Philosophy* 15; *Mathematics* 1; *Botany* 1; *Soils* 1. Such students should if possible organize their schedules for the major at the beginning of the sophomore year.

Those who choose geology and geography as a major in a general cultural program may satisfy the requirements by completing not less than twenty-four hours in any of the advanced courses in geology and geography, and fifteen hours of related subjects from the list in the preceding paragraph and from these added items: *Economics* 1, 2a, 2b, 82; *Sociology* 2, 3; *History* 42, 82, 83, 92a.

Those who have special interest in fields closely connected with some one branch of geology may also have approved by the professor in charge of that branch any of the following courses: *Chemistry* 130, 135, 205, 210, 220, 221, 225, 405, 410, 530; *Mathematics* 5, 10, 65a, 65b, 65c; *Physics* 60; *Biology* 1; *Zoology* 8.

Register for all courses with the Department.

GENERAL COURSES

***GEOLOGY A. GENERAL GEOLOGY AND PHYSIOGRAPHY.** Introduction to Earth Science. Throughout the year. Credit three hours a term; if taken after *Geology* 100, two hours a term. Mr. BURFOOT and Mr. VON ENGELN. Lectures, T Th 11. *McGraw* 165. Laboratory, M or W 1:40. *McGraw* 265.

Students must register for laboratory assignments. The course comprises an introduction to the various branches of geologic science, lithologic, physiographic, structural, glacial, economic, and historic. Methods of geologic and physiographic study in the field and laboratory are emphasized.

***GEOLOGY 100.** One term, fall or spring. Credit three hours. Mr. NEVIN. Lectures, M W 10. *McGraw* 165. Laboratory, M T or W 1:40. *McGraw* 130.

For students in Agriculture and for those in Arts and Sciences who do not plan to major in geology, or take courses other than *Geology* 202, 311, 401, 504. Those who plan to major in geology or to satisfy the science group requirement of the College of Arts and Sciences after taking *Geology* 100 will take *Geology A* for two hours credit a term.

The fundamental principles of this branch of science with chief emphasis on the physical side.

***202. GENERAL GEOGRAPHY.** Fall term. Credit three hours. No prerequisites. Mr. VON ENGELN. Lectures, M W F 9. *McGraw* 165.

A cultural course designed to acquaint the student with the basic elements of geography, together with a regional survey relating countries and productions to the elements and physical factors of geography. Intended to provide adequate conceptual background of world geography for other subjects, history, economics, etc.

*401. *ANCIENT LIFE*. Spring term. Credit three hours. No prerequisites but may well be preceded by Geology A or Geology 100. Mr. COLE. Lectures, T Th 10 and a third hour to be arranged. *McGraw* 450.

A cultural course devoted to a review of the fossil remains of life in the geological periods as indicative of the continuity of organic evolution. Attention given chiefly to vertebrate forms from fish to man. For advanced students the course is a supplement to Geology 403.

*504. *MINERAL RESOURCES*. Fall and spring terms. Credit two hours a term. Mr. ANDERSON. Lectures, T Th 9. *McGraw* 165.

A geographic, cultural study of the nature, utilization, occurrence, distribution, production, consumption, reserves, and political and commercial control of the world's important mineral resources. Fall term deals with the non-metals such as coal, petroleum, potash, phosphate, etc.; the spring term deals largely with the metals such as iron, the ferroalloy metals, copper, aluminum, lead, zinc, tin, antimony, etc.

DYNAMIC AND STRUCTURAL GEOLOGY

102. *STRUCTURAL GEOLOGY*. Fall term. Credit three hours. Prerequisite Geology A or permission of the instructor. Mr. NEVIN. Lectures, T Th 10. *McGraw* 150. Laboratory, Th 1:40. *McGraw* 150.

A study of geologic structures and their causes. Part of the laboratory periods will be spent in the field.

103. *SEDIMENTATION*. Spring term. Credit three hours. Prerequisite Geology A or as determined by the instructor. Registration only by permission. Mr. NEVIN. Lectures, M W 9. *McGraw* 150. Laboratory, Th 1:40. *McGraw* B41.

This course is devoted to a study of the principles involved in the formation of sediments.

106. *SPECIAL WORK IN SEDIMENTATION, STRUCTURAL, AND PETROLEUM GEOLOGY*. Throughout the year. Credit variable. Registration only by arrangement with instructor. Mr. NEVIN. Hours to be arranged. *McGraw* 250.

For advanced students and graduates. Original investigation adapted to the needs of the student.

107. *GEOLOGIC MAPPING*. Given in the Summer Field School.

Instruction in the fundamental methods used in geologic mapping, together with practical work in the field. For students majoring in Geology.

GEOMORPHOLOGY AND GLACIAL GEOLOGY

200. *GEOMORPHOLOGY*. Fall term. Credit three hours. Prerequisite, Geology A. Mr. VON ENGELN. Lectures, T Th 9. *McGraw* 265. Laboratory, T 1:40. *McGraw* 265.

The interpretation of land forms with regard to process and stage and the adjustment of topography to structure. The technology of geomorphological description.

205. *GLACIERS AND GLACIATION*. Spring term. Credit three hours. Prerequisite, Geology A. Mr. VON ENGELN. Lectures, T Th 9. *McGraw* 265. Laboratory, T 1:40. *McGraw* 265.

Living glaciers and the phenomena of the glacial period. Students are required to have one or more Saturdays free for all-day excursions in the Spring. Mapping and interpretation of glacial deposits.

208. *ADVANCED PHYSIOGRAPHY, EXPERIMENTAL WORK AND RESEARCH*. Credit variable. For advanced and post-graduate students. Registration by permission. Mr. VON ENGELN.

MINERALOGY AND PETROLOGY

311. *ELEMENTARY MINERALOGY*. Spring term. Credit three hours. Prerequisite, Chemistry 102 or 104. Mr. BURFOOT. Lectures, M W 10. *McGraw* 145. Laboratory, W 1:40. *McGraw* 145.

For beginners who desire a general knowledge of crystallography and of the commonest minerals, the properties by which they are recognized, their uses, and their significance as constituents of the crust of the earth. In the laboratory, various determinative methods are used for identifying the minerals.

316. *METAMORPHIC GEOLOGY*. Spring term. Credit three hours. For advanced students. Registration by permission only. Mr. BURFOOT. Lectures, M W 11. *McGraw* 145. Laboratory, S 9-11:30. *McGraw* 145.

A general survey of the field of metamorphic geology with especial emphasis on processes and criteria. Metamorphic differentiation, the facies classification of metamorphic rocks, and retrogressive metamorphism are among the subjects considered. Special suites illustrating these phenomena are used. Work with the petrographic microscope will be given to those students who are qualified and wish to take it. Given if desired by a sufficient number of students.

[317. *OPTICAL MINERALOGY*. Not given 1945-46.]

318. *PETROLOGY*. Fall term. Credit three hours. Prerequisite, Geology 317. Mr. BURFOOT. Lectures, M W 11. *McGraw* 145. Laboratory, F 9-11:30.

A consideration of the commoner kinds of igneous rocks, of various classifications used, and of the general principles of petrology, including the origin of and the conditions under which igneous rocks are formed.

319. *SEDIMENTARY PETROGRAPHY*. Spring term. Credit three hours. Prerequisite, Geology 317. Mr. BURFOOT. Lectures, T Th 10. Laboratory, F 9-11:30.

The methods of investigating the mineral composition, texture, and other physical characteristics of sedimentary rocks, and some of the applications of these methods to geological problems. Given if desired by a sufficient number of students.

320. *ADVANCED OR SPECIAL WORK IN MINERALOGY, CRYSTALLOGRAPHY, OR PETROLOGY*. Throughout the year. Credit variable.

Prerequisite, variable. Mr. BURFOOT. Hours to be arranged. *McGraw* 145. Adapted to the needs of the individual student.

321. *SEMINAR*. Throughout the year. Credit one hour a term. Mr. BURFOOT. Hours to be arranged. *McGraw* 145. Given if desired by a sufficient number of students.

PALEONTOLOGY AND STRATIGRAPHIC GEOLOGY

400. *HISTORIC GEOLOGY*. Fall term. Credit three hours. Prerequisite, Geology A. Mr. COLE. Lectures, M W 9. *McGraw* 165. Laboratory, F 1:40. *McGraw* 450.

Systematic study of the geologic history of the earth with reference to the rocks from the earliest periods to the present, their nature and distribution, orogenies, paleogeography, and the fossil remains and other characteristics on which their identification and correlation depend. Special emphasis on American geology. Field studies in the laboratory period in so far as weather and circumstances permit.

402. *STRATIGRAPHY*. Spring term. Credit three hours. Prerequisite, Geology 400. Mr. COLE. Lectures, M W 9. Laboratory, F 1:40. *McGraw* 450.

The principles of stratigraphy with reference to the factors upon which stratigraphic correlation and nomenclature are based, with special emphasis on the Paleozoic and with a world survey of Paleozoic rocks.

403. *INVERTEBRATE PALEONTOLOGY*. Fall and spring terms; fall, description, classification, and development of the organisms; spring, key fossils of the several geological periods. Credit three hours a term. Prerequisite, Geology 400 and, if possible, Biology 16, Invertebrate Zoology. Geology 402 may accompany. Lectures, T Th 11. *McGraw* 450. Laboratory, Th 1:40. *McGraw* 450.

In so far as weather and other circumstances permit some laboratory periods will be devoted to collection of fossil assemblages from selected horizons of the Paleozoic formations of central New York.

409. *GEOLOGY OF NEW YORK STATE*. Spring term. Credit two hours. Prerequisites, Geology A, 400, 402, 403, or permission of instructor. Mr. COLE. Lectures in winter months, all day field trips in spring months. Hours and days to be arranged. *McGraw* 450.

A course designed to acquaint the student, by lectures, readings, and field observation, with the outstanding geologic phenomena of New York State, especially with the classic Paleozoic section of the central New York region.

410. *MICROPALEONTOLOGY*. Spring term. Credit two hours. Prerequisite, permission of the instructor. Student should have Geology A, Biology 16, Geology 400 and 402. Mr. COLE. Hours to be arranged, in general two laboratory periods a week. *McGraw* 450.

Study of the microfaunas, chiefly Foraminifera, of the more recent geologic periods in their relation to correlation of beds, as used in the development of oil fields.

ECONOMIC GEOLOGY

500. *GENERAL ECONOMIC GEOLOGY*. Fall and spring terms. Credit three hours a term. Prerequisites, Geology A and 311. Mr. ANDERSON. Lectures, T Th 11. *McGraw* 150. Laboratory, F 1:40. *McGraw* 150.

Mode of occurrence and origin of the economically important mineral deposits. Fall term, the deposits of primary origin associated more or less closely with igneous phenomena; spring term, the deposits of secondary origin associated more or less directly with processes of weathering and sedimentation.

501. *ENGINEERING GEOLOGY*. Fall or spring term. For engineering students only, except that students who have had Geology A or 100 may take 501 for one hour credit. Credit three hours. Mr. ANDERSON. Lectures, M W 11. *McGraw* 165. Laboratory, T and Th 1:40. *McGraw* 362.

The practical application of geologic principles to engineering work, and study of the properties and occurrence of such economic materials as are of importance to engineering students.

502. *PETROLEUM GEOLOGY*. Spring term. Credit three hours. Prerequisite, Geology A or permission of instructor. Mr. NEVIN. Lectures, ————. Laboratory, ————.

A course on the geology and distribution of petroleum. Geology 503 should, if possible, be taken first.

[503. *PETROLEUM TECHNOLOGY*. Not given 1945-46.]

511. *ADVANCED OR SPECIAL WORK IN ECONOMIC GEOLOGY*. Fall and spring terms. Credit variable. Prerequisite, depending on the nature of the work. Mr. ANDERSON. Hours to be arranged. *McGraw* 250.

Work arranged to meet the needs and training of the student. May be largely guided study of geologic problems of advanced or special nature; or may be study of mineral deposits in the laboratory with aid of thin sections and polished sections, with emphasis on paragenetic relations.

512. *ECONOMIC GEOLOGY SEMINAR*. Fall and spring terms. Credit one hour a term. Mr. ANDERSON. Registration by invitation of instructor. Hours to be arranged. *McGraw* 250.

Seminar on timely topics in Economic Geology.

GERMAN

Mr. VICTOR LANGE, *Chairman*; MESSRS. A. L. ANDREWS, RUDOLF SCHAEFFER, HEINRICH SCHNEIDER, and ————.

For a major in German the following courses must be completed: (1) in German, courses 1-5 or their equivalent, and at least twenty-one hours of advanced courses, including 15, 21, and at least one course each in Lessing, Goethe, and Schiller; (2) in related subjects, at least fifteen hours selected from Bibliology, the Classics (Archaeology, Greek, Latin), English, History, Philosophy, Romance Languages, Russian Language and Literature, Scandinavian Languages and Literatures.

*1. *ELEMENTARY INTENSIVE COURSE*: Oral Training and Grammar Analysis. Each term. Credit six hours. Mr. SCHAEFFER and tutors. Daily at 8. *Goldwin Smith* 183.

This course is equivalent to first and second year German of the entrance requirements (credit two units). It may be elected for three hours' credit by students who have entrance credit for only one unit of German (first year German). Students will be required to schedule two additional hours of supervised oral work.

*1a. *COURSE FOR BEGINNERS*: Oral Training, Grammar, Composition, Translation. Fall term. Credit three hours. Mr. SCHAEFFER, Mr. ———, and tutors. M W F 9, 10, 12; T Th S 9. *Goldwin Smith* 183, 177.

This course is equivalent to first and second year German of the entrance requirements (credit two units). It may be elected by students who have had first year German (one unit). Students will be required to schedule one additional hour of supervised oral work.

*1b. *COURSE FOR BEGINNERS*: Oral Training, Grammar, Composition, Translation. Spring term. Credit three hours. Mr. SCHAEFFER and tutors. M W F 9, 10, 12; T Th S 9. *Goldwin Smith* 183, 177.

This course is the second term of 1a. Students will be required to schedule one additional hour of supervised oral work.

*1g. *COURSE FOR GRADUATES*. Mr. ———. See Announcement of the Graduate School.

*3. *INTERMEDIATE INTENSIVE COURSE*: Oral Training and Translation. Each term. Credit six hours. Prerequisite, German 1, 1b, or entrance credit for two units of German (first and second year German). Mr. SCHAEFFER and tutors. Daily at 11. *Goldwin Smith* 177.

This course is equivalent to third year German of the entrance requirements. Students will be required to schedule two additional hours of supervised oral work.

*3a. *INTERMEDIATE COURSE*: Oral Training, Grammar, Composition, Translation. Fall term only. Credit three hours. Prerequisite, German 1, 1b, or entrance credit for two units of German (first and second year German). Mr. SCHNEIDER and tutors. M W F 9; T Th S 10. *Goldwin Smith* 190.

This course is equivalent to third year German of the entrance requirements.

*3b. *INTERMEDIATE COURSE*: Oral Training, Grammar, Composition, Translation. Spring term only. Credit three hours. Prerequisite, German 3a. Mr. SCHNEIDER and tutors. M W F 9; T Th S 10. *Goldwin Smith* —.

This course is the second term of 3a.

*4. *COMPOSITION AND CONVERSATION*. Both terms. Credit three hours a term. Open to those who are taking or have taken German 3, or its equivalent. Mr. SCHNEIDER. M W F 11. *Goldwin Smith* 183.

Exercises conducted in German. Course 4 may be combined with courses 3 or 5.

*5. *MODERN GERMAN TEXTS*. Both terms. Credit three hours a term. Prerequisite, German 3, or its equivalent. Mr. ANDREWS. T Th S 11. *Goldwin Smith* 183.

Extensive reading and discussion.

[*7. *GERMAN LITERATURE FROM GOETHE TO THE PRESENT*. Two terms. Credit two hours a term. Open to sophomores and upperclassmen.

A survey of German literature in its relation to general European thought. Lectures in English with assigned reading in available translations. No requirements in German. May not be offered in fulfillment of the requirement in foreign language. Mr. LANGE. Not offered in 1945-46.]

*8. *SCIENTIFIC GERMAN*. Both terms. Credit three hours a term. Prerequisite, German 1-3, or three years of German in high school. Mr. ANDREWS. T Th S 10. *Goldwin Smith* 183.

10. *ADVANCED GERMAN COMPOSITION AND CONVERSATION*. Both terms. Credit three hours a term. Prerequisite, German 1-4, or the equivalent. Mr. SCHNEIDER. M W F 12. *Goldwin Smith* 182.

Exercises conducted in German. This course must be completed by students who desire to be recommended as teachers of German.

11. *SCHILLER'S LIFE AND WORKS*. Spring term. Credit three hours. Prerequisite, German 1-3, or the equivalent. Mr. ANDREWS. By appointment.

[13. *GOETHE'S LIFE AND WORKS, INCLUDING FAUST*. Two terms. Credit three hours a term. Prerequisite, German 1-3, or the equivalent. Mr. LANGE. Not offered in 1945-46.]

[15. *SURVEY OF GERMAN LITERATURE*. Two terms. Credit three hours a term. Prerequisite, German 1-3, or the equivalent. Not offered in 1945-46.

Lectures in English, collateral reading in German.]

[16. *CONTEMPORARY GERMAN LITERATURE*. One term. Credit three hours. Prerequisite, German 1-5, or the equivalent. Mr. SCHNEIDER. Not offered in 1945-46.]

17. *NINETEENTH CENTURY DRAMA*. Spring term. Credit three hours. Prerequisite, German 1-3, or the equivalent. Mr. SCHNEIDER. By appointment.

Kleist, Grillparzer, Hebbel, Hauptmann.

18. *LESSING'S LIFE AND WORKS*. Fall term. Credit three hours. Prerequisite, German 1-3, or the equivalent. Mr. SCHNEIDER. By appointment.

[19. *GERMAN LYRIC POETRY FROM GOETHE TO GEORGE*. One term. Credit three hours. Prerequisite, German 1-3, or the equivalent. Mr. LANGE. Not offered in 1945-46.

Lectures in English, with assigned reading.]

[20. *THE GERMAN NOVEL FROM 1800 TO THE PRESENT*. One term. Credit three hours. Prerequisite, German 1-3, or the equivalent. Mr. LANGE. Not offered in 1945-46.

Lectures in English, with assigned reading.]

[21. *INTRODUCTION TO THE STUDY OF THE HISTORY OF GERMAN LITERATURE*. One term. Credit three hours. Mr. SCHNEIDER. Not offered in 1945-46.

Lectures and practical assignments in bibliography.]

[35. *GERMAN ROMANTICISM*. One term. Credit two hours. Open to qualified undergraduates and graduates. Mr. LANGE.

Lectures in English on the main currents of feeling and the chief literary figures between 1780 and 1840. Discussion of texts and collateral reading. Not offered in 1945-46.]

[37. *MIDDLE HIGH GERMAN*. One term. Credit three hours. Prerequisite, German 1-5. Mr. ANDREWS. Not offered in 1945-46.]

[40. *TEACHERS' COURSE IN METHODS*. One term. Credit two hours. Prerequisite, German 1-5, 10, and twelve hours of advanced work in German literature or philology. Not offered in 1945-46.]

42. *GOTHIC*. Spring term. Credit three hours. Mr. ANDREWS. By appointment.

43. *OLD HIGH GERMAN*. Fall term. Credit three hours. Prerequisite, German 37. Mr. ANDREWS. By appointment.

49. *SEMINAR IN GERMAN LITERATURE*. Spring term. Credit two hours. Primarily for graduates. Mr. SCHNEIDER. By appointment.

52. *SEMINAR IN GERMANIC PHILOLOGY*. Fall term. Credit two hours. Primarily for graduates. Mr. ANDREWS. By appointment.

GOVERNMENT

Mr. R. E. CUSHMAN, *Chairman*; MESSRS. H. W. BRIGGS, M. EINAUDI, and E. HUZAR.

For a major in Government the following courses must be completed: (1) either course 1 and course 2 or 3, or Social Science A and B; (2) eighteen additional hours in the department; (3) in related subjects, at least twenty-four hours of unstarred courses to be selected from the following, of which twelve hours must be in History—any course in History; any unstarred course in Economics or Sociology; Philosophy 4, 5; Architecture 710, 711, 712, 713, 714.

Juniors and Seniors who have a grade of 85 or better in one-half the hours they have passed may take informal study in Government.

Candidates for honors in Government will be required to take three hours of informal study during each semester of the senior year. They will also be required to pass a comprehensive examination.

Students registered in the combined Arts-Law course with a major in Government will be required to complete a minimum of twelve hours of upperclass courses in Government and fourteen hours from the list of courses in related fields printed above.

*1. *AMERICAN NATIONAL GOVERNMENT*. Fall term. Credit three hours. Mr. CUSHMAN. Lectures, T Th 9. Quiz hours to be arranged. Goldwin Smith A.

American national Government, its historical development, organization, powers, and practical working.

*2. *COMPARATIVE GOVERNMENT*. Spring term. Credit three hours. Mr. EINAUDI. T Th 9 and a quiz hour to be arranged. *Boardman* 110.

A comparative study of basic governmental institutions and political processes, with major emphasis on Europe.

*3. *STATE AND LOCAL GOVERNMENT*. Spring term. Credit three hours. Mr. HUZAR. T Th 9 and a quiz hour to be arranged. *Boardman* 122.

American state and local governments, their historical development, organization, powers, and practical working.

6. *MUNICIPAL GOVERNMENT*. Fall term. Credit three hours. Open to sophomores with the consent of the instructor and to upperclassmen. Mr. HUZAR. T Th S 10. *Boardman* 320.

Urbanization; city-state relations; and politics, organization, finances, and selected functions of city government.

7. *PUBLIC ADMINISTRATION*. Fall term. Credit three hours. Open to sophomores with the consent of the instructor and to upperclassmen. Mr. HUZAR. M W F 11. *Boardman* 121.

Efficiency and responsibility in public administration; principles and problems of administrative organization, the civil service, fiscal management, and methods of administrative action.

[9. *INTRODUCTION TO INTERNATIONAL RELATIONS*. Fall term. Credit three hours. Open to sophomores and upperclassmen. Mr. BRIGGS.

A survey of nationalism, internationalism, imperialism, and the racial, political, economic, and geographical factors in modern international relations. Not given in 1945-46.]

10a. *DEVELOPMENT OF MODERN POLITICAL THOUGHT*. Fall term. Credit three hours. Open to sophomores with the consent of the instructor and to upperclassmen. Mr. EINAUDI. T Th S 10. *Boardman* 121.

Political thought from the sixteenth century to the French Revolution: from Bodin's "limited sovereignty" to Rousseau's "general will."

10b. *CONTEMPORARY POLITICAL THOUGHT*. Spring term. Credit three hours. Open to sophomores with the consent of the instructor and to upperclassmen. Mr. EINAUDI. T Th S 10. *Boardman* 320.

A study of the major developments in political thought in the nineteenth and twentieth centuries.

11a. *CONSTITUTIONAL GOVERNMENT IN EUROPE*. Fall term. Credit three hours. Open to sophomores with the consent of the instructor and to upperclassmen. Mr. EINAUDI. T Th S 9. *Boardman* 321.

The totalitarian crisis and its aftermath. The task of reconstruction of democratic and constitutional governments.

[11b. *COMPARATIVE STUDY OF PUBLIC REGULATION OF ECONOMIC LIFE*. Fall term. Credit three hours. Open to upperclassmen. Mr. EINAUDI.

An analysis, from the political and administrative point of view, of the most significant developments in the field of government regulation of economic life. Both American and European experience will be taken into account. Not given in 1945-46.]

[14a, 14b. *INTERNATIONAL LAW*. Two terms. Credit three hours a term. Open to qualified upperclassmen. Mr. BRIGGS.

A systematic study of the nature, development, and judicial application of the principles of international law. Cases, readings, discussions. Not given in 1945-46.]

15. *INTERNATIONAL ORGANIZATION*. Spring term. Credit three hours. Open to upperclassmen. Mr. BRIGGS. M W F 11. *Boardman* 122.

An analysis of international governmental procedures and institutions: international administration; international legislation; power politics and collective efforts to maintain international peace and security; the League of Nations; the United Nations Organization, and specialized agencies; the judicial function and the International Court of Justice.

[16a. *CONTEMPORARY AMERICAN FOREIGN POLICY: THE LATIN AMERICAN POLICY OF THE UNITED STATES*. Fall term. Credit three hours. Open to sophomores and upperclassmen. Mr. BRIGGS.

The relations of the United States with Mexico, Cuba, Panama, Santo Domingo, Haiti, Nicaragua, and the larger South American States; Dollar Diplomacy; Pan-Americanism; the Good Neighbor Policy; the relation of our Latin American policy to European developments. Not given in 1945-46.]

16b. *CONTEMPORARY AMERICAN FOREIGN POLICY: THE FAR EASTERN POLICY OF THE UNITED STATES*. Spring term. Credit three hours. Open to sophomores and upperclassmen. Mr. BRIGGS. M W F 9. *Boardman* 110.

An analysis of the relations of the United States with China, Japan, and the European powers with Far Eastern interests, primarily since 1898.

19. *CONGRESS: ORGANIZATION AND METHODS OF WORK*. Spring term. Credit three hours. Open to upperclassmen who have had course 1 or 3. Mr. HUZAR. M W F 10. *Boardman* 320.

Problems and practices of membership, organization, and operation of the national legislature.

20. *CONSTITUTIONAL LAW: THE AMERICAN FEDERAL SYSTEM*. Fall term. Credit three hours. Open to upperclassmen. Prerequisite, course 1, or the consent of the instructor. Mr. CUSHMAN. T Th S 11. *Boardman* 122.

Judicial interpretation of the constitution: the nature of judicial review; separation of governmental powers; relations between state and national governments; construction of national powers.

21. *CONSTITUTIONAL LAW: FUNDAMENTAL RIGHTS AND IMMUNITIES*. Spring term. Credit three hours. Open to upperclassmen. Prerequisite, course 20 or the consent of the instructor. Mr. CUSHMAN. T Th S 11. *Boardman* 122.

Privileges and immunities of citizenship; protection of civil and political rights; the obligation of contracts; due process of law and the equal protection of the laws.

22. *SEMINARY IN CONSTITUTIONAL PROBLEMS*. Spring term. Credit two hours. Open to graduate students and qualified seniors. Mr. CUSHMAN. T 2-4. *Boardman* 317.

23. *SEMINARY IN POLITICAL THEORY*. Throughout the year. Credit two hours a term. Open to graduate students and qualified seniors. Mr. EINAUDI. Hours to be arranged.

24. *SEMINARY IN INTERNATIONAL LAW AND INTERNATIONAL ORGANIZATION*. Spring term. Credit two hours. Open to graduate students and qualified seniors. Mr. BRIGGS. M 2-4. *Boardman* 225.

HISTORY

Mr. M. L. W. LAISTNER, *Chairman*; Messrs. KNIGHT BIGGERSTAFF, C. W. DE KIEWIET, P. W. GATES, F. G. MARCHAM, CURTIS NETTELS, and CARL STEPHENSON.

For a major in History the following courses must be completed: (1) in History, at least thirty hours; (2) in related subjects, at least eighteen hours which shall be determined by the student in consultation with his adviser. Of the hours in related subjects, at least six shall be in unstarred courses.

2a. *GREEK HISTORY AND CIVILIZATION*. Fall term. Credit three hours. M W F 9. *Boardman* 321. Mr. LAISTNER.

A general survey of Ancient Greece down to 146 B.C.

4. *THE HELLENISTIC AGE*. Fall term. Credit three hours. M W F 11. *Boardman* 321. Mr. LAISTNER.

An advanced course for upperclassmen and graduate students. Students must consult the instructor before registering.

22. *MEDIEVAL HISTORY*. Fall term. Credit three hours. M W F 10. *Goldwin Smith A*. Mr. STEPHENSON.

A sketch of the entire medieval period; lectures, reading, and map work.

23. *THE RISE OF THE UNIVERSITIES*. Fall term. Credit two hours. T Th 10. *Boardman* 226. Mr. STEPHENSON.

An advanced course with restricted enrolment. Student must consult the instructor before registering.

24. *SOCIAL PROBLEMS OF THE MIDDLE AGES*. Spring term. Credit two hours. T Th 10. *Boardman* 226. Mr. STEPHENSON.

An advanced course with restricted enrolment. Students must consult the instructor before registering.

42a. *EUROPEAN HISTORY, 1500-1815*. Spring term. Credit three hours. Not open to freshmen except those who have passed History 22. M W F 10. *Goldwin Smith A.* Mr. STEPHENSON.

Lectures, reading, and map work.

42b. *EUROPEAN HISTORY, 1815 TO 1914*. Fall term. Credit three hours. Not open to freshmen. T Th S 10. *Boardman* 322. Mr. DE KIEWIET.

43. *EUROPE SINCE 1914*. Spring term. Credit three hours. Not open to freshmen. T Th S 10. *Boardman* 322. Mr. DE KIEWIET.

61a. *HISTORY OF ENGLAND TO 1660*. Fall term. Credit three hours. T Th S 11. *Boardman* 110. Mr. MARCHAM.

A general survey of English History to the Restoration. Lectures and collateral readings.

61b. *HISTORY OF ENGLAND, 1660 TO THE PRESENT*. Spring term. Credit three hours. T Th S 11. *Boardman* 110. Mr. MARCHAM.

A general survey of English history since the Restoration. Lectures and collateral readings.

68. *ENGLAND AND THE BRITISH EMPIRE IN THE NINETEENTH AND TWENTIETH CENTURIES*. Fall and Spring terms. Credit three hours a term. Not open to freshmen. T Th S 9. *Boardman* 320. Mr. MARCHAM.

82. *AMERICAN HISTORY, 1607-1861*. May be given in the Spring term. Credit three hours. Not open to freshmen. M W F 9. *Boardman* 122. Mr. NETTELS.

83. *AMERICAN HISTORY, 1861-1945*. Fall term. Credit three hours. Not open to freshmen. M W F 9. *Boardman* 122. Mr. GATES.

91. *RECENT AMERICAN HISTORY*. Fall and spring terms. Credit three hours a term. M W F 12. *Boardman* 320. Mr. GATES.

An intensive course for upperclassmen. Prerequisite, History 82 and 83 or the consent of the instructor.

92a. *AMERICAN COLONIAL HISTORY TO 1763*. Fall term. Credit three hours. M W F 11. *Boardman* 320. Mr. NETTELS.

The founding of the colonies, the growth of self-government, economic development, early American culture, Britain's imperial policies, the Anglo-French conflict in America. Open to upperclassmen or with the consent of the instructor.

N. H. 1 and 2. AMERICAN HISTORY (Enrolment restricted to students in the V-12 programme of the Navy). Two terms. Credit two hours a term. Time and place to be announced later. Mr. NETTELS and Mr. GATES.

N. 3. NAVAL HISTORY AND ELEMENTARY STRATEGY (Enrolment restricted to students in the V-12 programme of the Navy). Spring term. Credit three hours. Time and place to be announced later. Mr. WEBSTER.

MATHEMATICS

Mr. R. P. AGNEW, *Chairman*; MESSRS. W. B. CARVER, WILLIAM FELLER, W. A. HURWITZ, B. W. JONES, MARK KAC, G. K. KALISCH, and R. J. WALKER.

For a major in Mathematics, the following courses must be completed: (1) in Mathematics, at least fifteen hours of unstarred courses; (2) in related subjects, at least fifteen hours to be selected from approved courses in Astronomy, Chemistry, Economics, Education, French, German, Italian, Philosophy, and Physics.

Students planning to teach Mathematics in secondary schools should make themselves familiar with the New York State requirements. They should bear in mind that the teaching of Mathematics is frequently combined with teaching of physical science or general science. The Department of Mathematics recommends, as minimum preparation for teaching the subject, Mathematics 65a, 65b, and six additional hours selected from the following list: Mathematics 65c, 70, 130, 140, 200, 215, 310. Students planning to teach primarily Mathematics should meet the requirements for a major in the subject.

For students in those colleges permitting removal of condition grades by examinations, such examinations will be given in courses 5, 10, 15, 50, 55, 60, 65 just before registration. For further information regarding the time and place of these examinations students should apply at White 223. No student may take more than one examination in any one term.

Students wishing to take any of the courses numbered above 65 are invited to confer with the teachers concerning these courses.

Of courses 1 to 65, not more than six hours may be taken simultaneously without the special permission of the department.

*1. *ELEMENTARY CONCEPTS OF MATHEMATICS.* Two terms. Credit three hours each term. Mr. JONES. M W F 8. White 121.

This course is intended primarily for students who are not planning to continue the study of mathematics. Primary emphasis will be placed on the fundamental ideas common to all mathematics rather than on the technique of any one part of the subject. The student will be encouraged to apply the logical processes of mathematics to problems arising in everyday experience. Extensive skill in the manipulation of mathematical symbols will not be emphasized. Although this course is not designed to satisfy prerequisites for courses in Analytic Geometry and Calculus, a student who has passed it with sufficiently high credit may be admitted to such courses.

*5. *SOLID GEOMETRY*. First term only. Credit three hours except for students offering Solid Geometry for entrance. M W F 8.

*10. *COLLEGE ALGEBRA*. One term. Credit three hours. First term, T Th S 9; M W F 12. Second term, M W F 9.

*15. *PLANE TRIGONOMETRY*. One term. Credit three hours except for students offering Trigonometry for entrance. First term, M W F 10; M W F 12. Second term, T Th S 10; M W F 12.

*16. *SPHERICAL TRIGONOMETRY AND MAP PROJECTIONS*. One term. Credit three hours. First term, M W F 10. Second term, T Th S 10.

*55a, *55b. *ANALYTIC GEOMETRY AND CALCULUS*. Credit five hours for each course. M-F 8. Primarily for students in the College of Engineering; the prerequisites for such students are Mathematics 15, and Mathematics 5 or 10, or the equivalent. For students in the College of Arts and Sciences the prerequisites for Mathematics 55a are the same as those stated below for Mathematics 65a.

*60a, *60b, *60c. *ANALYTIC GEOMETRY AND CALCULUS*. Credit three hours for each course. T Th S 11 and other hours to be arranged. Primarily for students in the College of Engineering; the prerequisites for such students are Mathematics 15 and Mathematics 5 or 10 or the equivalent. For students in the College of Arts and Sciences, the prerequisites for Mathematics 60a are the same as those stated below for Math. 65a.

*65a, *65b, *65c. *ANALYTIC GEOMETRY AND CALCULUS*. Credit three hours for each course. T Th S 11 and other hours to be arranged. Primarily for students in the College of Arts and Sciences. Prerequisites, Mathematics 15 or the equivalent and a thorough preparation in Intermediate Algebra. Students without thorough preparation in Intermediate Algebra are advised to take Mathematics NM1 (in the Navy curriculum) or 10 before taking Mathematics 65a. Mathematics 10 may be taken simultaneously with Mathematics 65a. Some students interested in Mathematics or allied subjects will be expected to take 65a, 65b, and 65c.

90. *TEACHERS' COURSE*. Second term only. Credit three hours. Prerequisite or parallel course, Mathematics 65b or the equivalent. T Th S 11. Mr. CARVER. *White* 101.

This course will treat certain selected topics in the mathematics taught in the secondary schools in order to contribute to the enrichment of such teaching, and to give a clearer understanding of the meanings of certain of the concepts and processes involved.

133. *DETERMINANTS AND MATRICES*. Second term only. Credit three hours. Prerequisite, Mathematics 65b or the equivalent. M W F 10. Mr. KALISCH. *White* 103.

A treatment of such topics as determinants, matrices, linear dependence, linear equations, and linear transformations.

140. *ELEMENTARY THEORY OF NUMBERS*. First term only. Credit three hours. Prerequisite, Mathematics 65b or the equivalent. T Th S 11. Mr. JONES. *White* 121.

A study of properties of divisibility, linear and quadratic congruences, primitive roots, and other topics.

141. *ADVANCED THEORY OF NUMBERS*. Second term only. Credit three hours. Prerequisite, Mathematics 140. T Th S 11. Mr. JONES. *White* 121.

Farey series, certain Minkowski theorems on lattices, approximations of irrationals by rational numbers, Waring's problem, and other allied topics.

200. *ELEMENTARY DIFFERENTIAL EQUATIONS*. One term. Credit three hours. Prerequisites, Mathematics 60c, 65c, or the equivalent. First term, T Th S 10 and other hours to be arranged. Second term, T Th S 10 and other hours to be arranged.

201. *TOPICS IN APPLIED MATHEMATICS*. First term only. Credit three hours. Prerequisite, Mathematics 200 or the equivalent. M W F 8. Mr. KAC. *White* 103.

Laplace transform with applications to solving ordinary and partial differential equations. Elements of the theory of functions of a complex variable. Applications to various problems in Physics.

215. *ADVANCED CALCULUS*. Two terms. Credit three hours each term. Prerequisite, Mathematics 60c or 65c or the equivalent. M W F 11. Mr. AGNEW. *White* 115.

A careful study of limits, continuity, derivatives, and Riemann integrals. Functions of several variables. Multiple and line integrals. The course is designed to furnish necessary preparation for advanced work in analysis and applied mathematics.

220. *THEORY OF FUNCTIONS OF A REAL VARIABLE*. Two terms. Credit three hours each term. Prerequisite, Mathematics 215. M W F 10. Mr. FELLER. *White* 101.

Metric and linear spaces, and functions defined over them; measure and integration.

310. *PROJECTIVE GEOMETRY*. Two terms. Credit three hours each term. Prerequisite, Mathematics 60b or 65b. M W F 9. Mr. FELLER. *White* 101.

A first course in projective geometry, including both synthetic and analytic methods.

400a. *PROBABILITY AND STATISTICS*. First term only. Credit three hours. Prerequisite, Mathematics 60c or 65c. T Th S 10. Mr. KAC. *White* 103.

Introduction to the modern theory of probability with emphasis on random variables, distribution functions, moment generating functions and limit theorems. Normal distribution with various applications.

400b. *PROBABILITY AND STATISTICS*. Second term only. Credit three hours. Prerequisite, Mathematics 400a. T Th S 10. Mr. KAC. *White* 103.

Derivation of fundamental distributions used in practical statistics. Advanced application of probability theory to statistics and Physics.

420. *VECTOR ANALYSIS*. Second term only. Credit three hours. Prerequisite, Mathematics 60c or 65c. T Th S 9. Mr. KAC. *White* 103.

The algebra and calculus of vectors, with applications.

480. *DIFFERENTIAL EQUATIONS OF MATHEMATICAL PHYSICS*. Two terms. Credit three hours each term. Prerequisite, Mathematics 215. M W F 11. Mr. HURWITZ. *White* 111.

The derivation of the differential equations, with appropriate boundary conditions, which arise in certain problems of mathematical physics; the mathematical properties of solutions, and the physical meanings of these properties.

500. *PROBLEMS, RESEARCH, AND INFORMAL STUDY*. For properly qualified students, members of the department will direct reading and research not necessarily associated with any course.

The following courses are offered frequently, but not every year: Foundations of Mathematics, Modern Algebra, Algebraic Numbers, Theory of Equations, Linear Algebras, Symbolic Logic; Almost Periodic Functions, Calculus of Variations, Real Functions, Complex Variables; Analytic Geometry of Space, Geometry of Hyperspace, Theory of Lattices, Non-Euclidean Geometry, Tensor Analysis, Algebraic Curves; Orthogonal Functions, Potential Functions, Mechanics, Hydrodynamics, Fourier Series, and Elasticity.

MUSIC

Mr. JOHN M. KUYPERS, *Chairman*; Messrs. ERIC DUDLEY and DONALD J. GROUT; Miss CLAIRE JAMES, Messrs. OTTO KINKELDEY, ROBERT PALMER, EGON PETRI, and PAUL J. WEAVER.

For a major in music, the following courses must be completed: (1) a minimum of twenty hours of advanced courses, the sequence of courses emphasizing either critical and historical work or theoretical and creative work; (2) in related subjects, a minimum of fifteen hours to be chosen with the approval of the adviser. Students who wish to major in music should consult the chairman of the department at the beginning of their freshman year or as soon thereafter as possible.

A large collection of recorded music and scores is housed in the Music Building at 320 Wait Avenue, where a number of phonograph listening rooms are available. These facilities may be used by any student at hours to be announced from term to term.

Choral and instrumental ensembles are trained and directed by members of the departmental staff each term, and all students who are interested are invited to join these groups. These ensembles include the Sage Chapel Choir, the Cornell Chorus, the Men's and Women's Glee Clubs, the Bands, the Orchestra and Chamber Music Groups. Announcements of tryouts will be made at the beginning of each term.

MUSIC THEORY

1. Theory I. *THE ELEMENTS OF MUSIC*. Two terms. Credit three hours a term. M W F 8 and 9. Laboratory sections, T Th 8 and 9. Assign-

ment to sections must be approved at time of registration by the instructor. The laboratory periods will satisfy part of the normal requirements of preparation for the lecture periods. Mr. PALMER.

This course involves a thorough oral and written study of time and rhythm, scales and triads, including the application of these materials to the keyboard; the analysis, sight-singing, and dictation of melodies, as well as some original composition of simpler melodic ideas; leading to the study of chord choice and the fundamentals of harmony. This course is prerequisite to all other courses in the theory of music and is recommended as a background for music courses carrying numbers over 100.

101. Theory II. *ELEMENTARY HARMONY*. Two terms. Credit three hours a term. M W F 10. Prerequisite, Music 1 or its equivalent. Mr. PALMER.

This course is designed to develop facility in the hearing, reading and writing of simple harmonic materials. There is an elementary analysis of the homophonic forms and some original work in these forms.

201. Theory III. *ADVANCED HARMONY AND THE PRINCIPLES OF COUNTERPOINT*. Two terms. Credit three hours a term. Prerequisite, Music 101 or its equivalent. M W F 11. Mr. PALMER.

This course is a continuation of Theory II. This course includes the study of modulation, altered and mixed chords, and the harmonization of more elaborate chorale melodies leading to contrapuntal harmony. Basic contrapuntal principles are studied, including the devices of imitation and canon as well as the invention and simpler fugal forms. A thorough analysis of the polyphonic forms in undertaken and original work in these forms constitutes the basis of the course.

301. Theory IV. *ANALYTIC TECHNIQUE AND THE PRINCIPLES OF COMPOSITION*. Two terms. Credit two hours a term. T Th 10. Prerequisite, Music 201 or its equivalent. Mr. PALMER.

This course is a survey of musical literature from the 10th to the 20th centuries with the purpose of developing a general technique of analysis applicable to the music of any period. It covers the structural, textural, and aesthetic factors of each period and in this way gives insight into the general principles of musical composition. Original work will be undertaken according to the desire and need of the individual student.

MUSIC APPRECIATION AND ENSEMBLE

11. *THE ART OF MUSIC*. Two terms. Credit three hours a term. M W F 11. *Goldwin Smith A.* Open to all students. Mr. KUYPERS.

An approach to the rational understanding and enjoyment of the art of music, offered especially for students who have had no technical training in the subject. The first term covers a study of the elements of music, the media of musical expression and musical forms. The second term covers a study of the work of representative composers in relation to their social and artistic environment. Most of the outside work in this course consists of attending concerts and studying phonograph records. Students are advised not to take the second term of this course without having taken the first term or its equivalent.

15. *CHORAL AND INSTRUMENTAL ENSEMBLE, FIRST YEAR.* Two terms. Credit one hour a term. Either term may be taken without the other. Hours to be arranged. Open to all students who are active members of the Sage Chapel Choir, the Cornell Chorus, the University Orchestra, or the Men's or Women's Glee Club. Mr. GROUT, Mr. KUYPERS, and Mr. WEAVER.

An approach to the understanding of choral and instrumental music, partly through performance of music, and partly through study of the music performed and of comparable music. The aim of this course is an appreciation of the art as intensified through performance itself. In addition to one weekly lecture, the rehearsals of the organization to which the student belongs will serve as laboratory periods for this course.

115. *CHORAL AND INSTRUMENTAL ENSEMBLE, SECOND YEAR.* Two terms. Credit one hour a term. Hours to be arranged. Prerequisite, Music 15 or its equivalent. Open only to members of one of the musical organizations. Mr. GROUT, Mr. KUYPERS, and Mr. WEAVER.

This course is a continuation of Music 15.

MUSIC HISTORY

21. *HISTORY OF MUSIC.* Two terms. Credit three hours a term. M W F 12. *Goldwin Smith A.* Open to sophomores and upperclassmen, and to freshmen by permission. Mr. WEAVER.

A survey of the evolution of the art of music, with special reference to the development of musical styles from period to period, and to the position of music in the social and artistic life of nations. The first term covers the period from the beginning of the Christian era through the time of Bach and Handel (approximately 1750). The second term covers the period from then until the present day. Either term of this course may be taken without the other.

121. *THE OPERA.* Fall term. Credit three hours. M W F 11. Prerequisite, Music 21 or its equivalent. Mr. WEAVER.

A survey and study of the development of operatic music from its beginnings to the present time.

123. *ORCHESTRAL MUSIC.* Spring term. Credit three hours. M W F 11. Prerequisite, Music 21 or its equivalent. Mr. WEAVER.

A survey and study of the development of orchestral music from its beginning to the present day.

223. *BEETHOVEN.* Spring term. Credit two hours. T 2 to 4. Prerequisites, at least one course from the group Music 121-127 and at least two terms of Music Theory. Mr. WEAVER.

A study of the life and works of Beethoven. Special topics will be assigned to each student, related to the field covered by his prerequisite courses.

224. *BRAHMS.* Fall term. Credit two hours. T 2 to 4. Prerequisites, at least one course from the group Music 121-127 and at least two terms of Music Theory. Mr. WEAVER.

A study of the life and works of Brahms. Special topics will be assigned to each student, related to the field covered by his prerequisite courses.

321. *MUSIC OF THE BAROQUE PERIOD*. Two terms. Credit three hours a term. M W F 10. Prerequisites, Music 11, Music 21 and Music 101 or their equivalents. Mr. GROUT.

A study of the forms, styles, principal composers and representative compositions of the period 1600-1750.

APPLIED MUSIC

401. *FIRST YEAR, INDIVIDUAL INSTRUCTION IN VOICE, ORGAN, PIANO, STRING, WOODWIND, AND BASS INSTRUMENTS*. Credit, two hours a term in the case of qualified students who are majoring in music; for other students, no credit. Mr. DUDLEY, Mr. GROUT, and Miss JAMES.

This course is offered primarily for students who are majoring in music, and for such students the work is correlated with other courses in music being taken. Whenever the facilities of the department permit, other students may take this work without credit. Permission to register, whether with or without credit, should be secured from the chairman of the department.

Students should consult the instructor at the beginning of each term as to hours for instruction, and the secretary of the department as to hours for the use of practice rooms.

A fee of \$2 a half-hour is charged for this instruction, except in the case of vocal instruction, the fee for which is \$50 for the term. A fee of \$7.50 is charged for a daily one-hour assignment to a practice room equipped with piano. A term fee of \$30 is charged for a daily one-hour assignment for the use of a pipe organ in Bailey Hall or the Sage Chapel.

402. *SECOND YEAR, INDIVIDUAL INSTRUCTION*. A continuation of Music 401, open to students who have completed that course. The credits, conditions, and regulations applying to Music 401 apply also to this course.

451. *PIANO MASTER CLASS*. Two terms. Credit, two hours a term in the case of qualified students who are majoring in music. Mr. PETRI.

A limited number of advanced piano students will be accepted for this course. Those interested should consult the chairman of the department.

COURSES FOR GRADUATES

421. *INTRODUCTION TO RESEARCH*. Two terms. Credit two hours a term. M 2 to 4. Prerequisites, a reading knowledge of French and German and a fair knowledge of music theory and general music history. Mr. GROUT.

The basic materials and techniques of musicological research.

This course is open to graduate students (and, by permission, seniors).

501. *SEMINAR IN COMPOSITION*. Two terms. Credit two hours a term. Hours to be arranged. Mr. PALMER.

A limited number of graduate students (and, by permission, seniors) will be admitted to this course who have (1) facility in the hearing, reading, and writing of melody, harmony, and counterpoint, (2) a working knowledge of soprano, alto, tenor, and bass clefs, and (3) facility in score reading.

The work is intended to make the student acquainted with compositional practices in various styles, and to develop the student's creative abilities.

521. *SEMINAR IN MUSICOLOGY*. Two terms. Credit two hours a term. Hours to be arranged. Mr. KINKELDEY.

This course is primarily for graduates (and, by permission, seniors) who have (1) the requisite knowledge of one or more of the important foreign languages, (2) a fair knowledge of music theory, and (3) some skill in practical music.

The work is intended to make the student acquainted with the accomplishments of the past and with modern methods in all fields, scientific, aesthetic, and historical, of musical research and investigation. Special topics or fields of study will be selected for each term after consultation with the class.

PHILOSOPHY

Mr. G. WATTS CUNNINGHAM, *Chairman*; Messrs. E. A. BURTT, A. E. MURPHY, RICHARD ROBINSON, GEORGE H. SABINE, and HAROLD R. SMART.

For a major in Philosophy, the standard requirement is as follows: (1) in Philosophy twenty-one hours, including courses 1b and 5 and one advanced course, all to be chosen with the approval of the student's adviser; (2) in related subjects, eighteen hours, to be chosen with the approval of the adviser. This requirement, however, will be diminished by six hours to allow for a final comprehensive examination, if the student elects to take such an examination. The courses thus to be omitted will be determined by the adviser. The major may emphasize aesthetics, social studies, history, logic, or religion. In each case an integrated program of studies must be selected, subject to the approval of the adviser.

Students registered in the combined Arts-Law course with a major in philosophy will be required to complete 12 hours in philosophy, including course 5, and 9 hours in related subjects.

*1a. *PHILOSOPHICAL CLASSICS*. Fall term (repeated in spring term). Credit three hours. Open to freshmen and sophomores.

Fall term:

Sec. 1, M W F 9. *Goldwin Smith* 227. Mr. BURTT.

Sec. 2, M W F 12. *Goldwin Smith* 227. Mr. ROBINSON.

Spring term:

Sec. 1, T Th S 9. *Goldwin Smith* 227. Mr. SMART.

Sec. 2, M W F 9. *Goldwin Smith* 227. Mr. BURTT.

A careful study of Lucretius' *On the Nature of Things*, Plato's *Republic*, and J. S. Mill's *On Liberty*. In studying Plato and Mill, special attention is paid to the philosophy of democracy.

1b. *PHILOSOPHICAL CLASSICS* (second course). Fall term. Credit three hours. Prerequisite, Philosophy 1a. M W F 11. *Goldwin Smith* 221. Mr. BURTT.

Reading and discussion of somewhat more advanced texts than those used in Philosophy 1a, including Plato, Hume, and Descartes.

*2. *LOGIC*. Fall term (repeated in spring term). Credit three hours.

Fall term:

Sec. 1, M W F 11. *Goldwin Smith* 227. Mr. ROBINSON.

Sec. 2, T Th S 9. *Goldwin Smith* 227. Mr. SMART.

Spring term:

Sec. 1, M W F 11. *Goldwin Smith* 227. Mr. BURTT.

Sec. 2, M W F 9. *Goldwin Smith* 221. Mr. ROBINSON.

An elementary study of the laws of valid reference and the causes of fallacy.

3. *PROBLEMS IN PHILOSOPHY*. Fall term. Credit three hours. Open to sophomores, juniors, and seniors. T Th S 11. *Goldwin Smith* 225. Mr. SMART.

Fundamental problems of philosophy and the most important types of philosophical theory.

4. *ETHICS*. Spring term. Credit three hours. Open to sophomores, juniors, and seniors. M W F 11. *Goldwin Smith* 221. Mr. ROBINSON.

A study of the good life, and of human nature as it bears on the good life.

5. *HISTORY OF PHILOSOPHY*. Fall and spring terms. Credit three hours a term. Open to sophomores, juniors, and seniors. T Th S 10. *Goldwin Smith* 225. Mr. CUNNINGHAM.

Occidental philosophical thought from its origin among the Greeks to the present time; the most important systems in their cultural context and their application to social, religious, and educational problems. Fall term, Ancient and Mediaeval; spring term, Modern.

8b. *AESTHETICS: PHILOSOPHY OF ART*. Spring term. Credit three hours. Prerequisite, three hours of philosophy. M W F 12. *Goldwin Smith* 227. Mr. ROBINSON.

An introduction to several modern theories of art. Emphasis is laid on the underlying principles of the aesthetic experience with particular reference to painting and sculpture.

11. *CONTEMPORARY PHILOSOPHY*. Spring term. Credit three hours. Prerequisite, six hours in philosophy or permission of the instructor. M W F 9. *Goldwin Smith* 225. Mr. MURPHY.

Main tendencies in recent analytic and speculative philosophy with particular reference to instrumentalism, logical positivism, and Whitehead's philosophy of organism.

12. *AMERICAN PHILOSOPHY*. Fall term. Credit three hours. Open to juniors and seniors. M W F 9. *Goldwin Smith* 225. Mr. MURPHY.

The development of American thought from Jonathan Edwards to the present. Puritanism, the Enlightenment, transcendentalism, evolutionary science and religion, the philosophies of Royce, James, Santayana, and Dewey. Tradition and social criticism in recent philosophy.

13. *PHILOSOPHY OF RELIGION*. Spring term. Credit three hours. Open to juniors and seniors; to sophomores by special permission. M W F 12. *Goldwin Smith* 225. Mr. BURTT.

A study of the major types of religious belief in the modern world in relation to their philosophical background. Special attention is given to the interaction between religion and democratic ideals.

14. *HISTORY OF RELIGIONS*. Fall term. Credit three hours. Open to juniors and seniors; to sophomores by special permission. M W F 12. *Goldwin Smith* 225. Mr. BURTT.

A general survey of the development of ritual, practice, and belief in religions of selected cultures.

15. *PHILOSOPHY OF SCIENCE*. Spring term. Credit three hours. Open to juniors, seniors, and graduates. T Th S 11. *Goldwin Smith* 227. Mr. SMART.

An historical study of the natural and social sciences in their relations with philosophy, and a discussion of some recent works on the philosophy of these sciences.

16. *HISTORY OF PHILOSOPHICAL IDEAS*. Fall and spring terms. Credit three hours a term. First term prerequisite to second. Open to juniors and seniors. M W F 10. *Goldwin Smith* 225. Mr. MURPHY.

The ideas of reason, freedom, and progress. (a) Their development in European thought to 1800 and their use in the determination of standards of judgment, conduct and social action. (b) Their reinterpretation in the light of nineteenth century and contemporary criticism; their philosophical validity.

25. *PLATO AND ARISTOTLE*. Fall term. Credit three hours. Open to upperclassmen and graduates. M W F 9 (or hour to be determined). *Goldwin Smith* 220. Mr. ROBINSON.

30. *EMPIRICISM AND RATIONALISM*. Fall and spring terms. Credit three hours a term. Primarily for graduates, open to seniors by permission of the instructor. T 3 (or hour to be determined). *Goldwin Smith* 220. Mr. SMART.

The general history of the two schools with a critical analysis of the main works of Descartes, Leibniz, Locke, and Hume.

39. *SEMINAR IN CONTEMPORARY PHILOSOPHY*. Fall and spring terms. Credit three hours a term. Primarily for graduates, open to seniors by permission of the instructor. M 2 (or hour to be determined). *Goldwin Smith* 220. Mr. MURPHY.

Topic to be determined.

INFORMAL STUDY. Any student who may desire to do informal study in philosophy should confer with the member of the instructing staff with whom he proposes to work.

PHYSICS

Mr. R. C. GIBBS, *Chairman*; Messrs. L. L. BARNES, J. R. COLLINS, F. E. DART, C. W. GARTLEIN, G. E. GRANTHAM, PETER HAVAS, H. E. HOWE, J. G. MOORHEAD, C. C. MURDOCK, and D. H. TOMBOULIAN.

Several other members of the Physics staff who have been on leave for war work are likely to be back in residence before the end of the College year.

For a major in Physics, the following courses must be completed: (1) in Physics, twenty-four hours of unstarred courses, which shall include at least three hours of Course 105 or the equivalent in advanced laboratory work, and nine hours selected from classroom credit in Courses 111-175; (2) in related subjects, Mathematics 200, and one of the following groups; Philosophy 5, or 12 hours, chosen with the approval of the major adviser, in either Astronomy or Chemistry.

Subject to the rules of the student's college, examinations for those who were unavoidably absent from a final examination and for those who have a condition or an incomplete to make up in Courses 3 to 22 inclusive will be held in Rockefeller B at 9 A.M. on the Friday preceding registration for a new term. A permit (Registrar's copy) to take such an examination should be presented at the time of the examination. Application for the permit should be made at the Office of the Dean or Director of the student's college or school.

*3. *INTRODUCTORY EXPERIMENTAL PHYSICS*. Fall term. Credit three hours. Demonstration lectures, Mr. HOWE. M F 9 or 11. Rockefeller A. One recitation and one laboratory period a week, as arranged. Mr. Howe and assistants.

Mechanics, properties of matter, sound, and heat.

*4. *INTRODUCTORY EXPERIMENTAL PHYSICS*. Spring term. Credit three hours. Prerequisite, Course 3 or entrance Physics. Staff and hours as in Course 3.

Electricity, magnetism, and light.

*7. *INTRODUCTORY EXPERIMENTAL PHYSICS*. Fall term. Credit four hours. Demonstration lectures, Mr. HOWE. M F 9 or 11. Rockefeller A. Two recitations a week, as arranged. Mr. BARNES. One laboratory period a week as arranged. Messrs. HOWE and BARNES and assistants.

Mechanics, properties of matter, sound and heat, with emphasis upon problem solving and discussion of principles. This course will be conducted on the assumption that the students have a good working knowledge of arithmetic and intermediate algebra.

NOTE:—Students who plan to take more than eight semester hours of Physics should begin college Mathematics not later than the term in which they register for Physics 7.

*8. *INTRODUCTORY EXPERIMENTAL PHYSICS*. Either term. Credit four hours. Prerequisite, Physics 7 or knowledge of Trigonometry (or Mathematics 15 in parallel) and Physics 3 or entrance Physics. Normally follows Physics 7 but may be taken before Physics 7. Fall term, lectures, Mr. GRANTHAM. T Th 9 or 11. Rockefeller A. Two recitations and one laboratory period a week as arranged, Mr. GRANTHAM and assistants. Spring term. Staff and hours as in Course 7.

Electricity, magnetism, and light, with emphasis upon problem solving and discussion of principles.

*11. *INTRODUCTORY EXPERIMENTAL PHYSICS*. Either term. Credit four hours. Prerequisite, Calculus or simultaneous registration in

Mathematics 55a, 60a or 65a. Entrance Physics desirable but not required. Lectures, Mr. GRANTHAM. W S 9 or 11. *Rockefeller* A. Two recitations and one laboratory period a week as arranged. Messrs. GRANTHAM, DART, MOORHEAD, and assistants.

Demonstrations, theory, problems, and experiments covering the subjects of mechanics, wave motion, heat, and sound. Required of all students in Engineering.

*12. *INTRODUCTORY EXPERIMENTAL PHYSICS*. Either term. Credit four hours. Prerequisite, same as for Physics 11. Lectures, Mr. GRANTHAM. T Th 9 or 11. *Rockefeller* A. Two recitations and one laboratory period a week as arranged. Staff as in Course 11.

Demonstrations, theory, problems, and experiments covering the subjects of electricity, magnetism, and light. Normally follows Physics 11 but may be taken before Physics 11. Required of all students in Engineering.

21. *ELECTRICITY AND MAGNETISM*. Either term. Credit three hours. Prerequisites, Physics 11 and 12 and Mathematics 60c or 65c (or either in parallel). Two classroom periods a week and one laboratory period in alternate weeks as assigned. Mr. TOMBOULIAN and assistants. Required of candidates for degrees of B.Chem.E., B.E.E., and B.M.E.

22. *OPTICS AND ELECTRONICS*. Either term. Credit three hours. Prerequisites, same as for Physics 21. Two classroom periods a week and one laboratory period in alternate weeks as assigned. Mr. TOMBOULIAN and assistants. Required of candidates for degrees of B.Chem.E., B.E.E., and B.M.E.

60. *PHYSICAL MEASUREMENTS*. Either term. Credit three hours. Prerequisites, Introductory Physics and Trigonometry. Three laboratory periods a week. Laboratory work to be interrupted at intervals for seminar discussions. Mr. MOORHEAD. M W F 1:40-4:30. *Rockefeller* 354.

Mechanics, heat, and light.

63. *ELECTRICAL MEASUREMENTS*. Either term. Credit three hours. Prerequisites, Introductory Physics and (or in parallel) Integral Calculus. Two laboratory periods and one class period a week. Mr. MOORHEAD. Laboratory open M W F 1:40-4:30. *Rockefeller* 354. Class period to be arranged.

Direct current networks, capacitance, self and mutual inductance, time constant, ballistic galvanometer, hysteresis, alternating currents, impedance bridges, oscillations.

64. *HEAT*. Spring term. Credit three hours. Prerequisites, Introductory Physics and (or in parallel) Integral Calculus. Three classroom periods a week. Mr. GIBBS. M W F 8. *Rockefeller* 154.

A general discussion of heat, including kinetic theory and thermodynamics.

65. *MECHANICS AND PROPERTIES OF MATTER*. Fall term. Credit three hours. Prerequisites, Introductory Physics and (or in parallel) Integral Calculus. Three classroom periods a week. Mr. GIBBS. M W F 8. *Rockefeller* 154.

Linear and plane kinematics of a mass point, Newton's laws, linear plane dynamics, work and energy, simple harmonic motion, dynamics of a system of particles, statics and dynamics of rigid bodies, hydrostatics, fluid dynamics, elasticity, and wave motion and sound.

105. *ADVANCED LABORATORY*. Credit three hours a term. Prerequisites, Physics 60, 63, 64, and 65 or their equivalents. Two laboratory periods and one discussion period a week. Mr. COLLINS. Laboratory open T W Th F 1:40-4:30. Discussion period to be arranged. *Rockefeller* 301.

Experimental work in a wide variety of fields is offered to meet the needs of the individual student. Considerable time may be spent on a relatively few topics or many experiments may be performed to gain acquaintance in several fields. The laboratory work is individual and stress is laid on independent work on the part of the student. Among the topics for which facilities are available are: Mechanics, acoustics, optics, spectroscopy, electrical circuits, electronics and ionics, heat and temperature measurements.

111. *ANALYTICAL MECHANICS*. Spring term. Credit three hours. Prerequisites, Physics 65 (or NPH 3) and Differential Equations. Three classroom periods a week. Mr. ————. *Rockefeller* C. T Th S 8.

Analytical mechanics of material particles, system of particles and rigid bodies; Lagrange's equations; oscillations, forced vibrations.

123. *ELECTRICITY AND MAGNETISM*. Spring term. Credit three hours. Prerequisites, Physics 21 or Calculus and (or in parallel) Physics 63. Three classroom periods a week. Mr. MURDOCK. *Rockefeller* 104. T Th S 9.

Electrostatic and electromagnetic fields; laws of Gauss, Ampere, and Faraday; equations of Poisson, Laplace, and Maxwell; displacement current; plane electromagnetic waves in a vacuum; dielectric polarization; magnetic media; plane waves in material bodies; propagation of energy in electromagnetic fields.

124. *ELECTRICITY AND MAGNETISM*. Fall term. Credit five hours. Prerequisites, Physics 123 (or NPH 7) and Differential Equations. Three classroom periods a week. Mr. ————. T Th S 9. *Rockefeller* 104. Two laboratory periods a week, T W or Th F 1:40 to 4:30. *Rockefeller* 301.

General circuit theory; steady current circuits, non-steady current circuits, alternating current circuits; steady current networks; alternating current networks; frequency characteristics of networks; filter circuits.

135. *OPTICS*. Fall term. Credit five hours. Prerequisites, Physics 60 and Calculus. Three classroom periods a week. Mr. COLLINS. T Th S 8. *Rockefeller* C. Two laboratory periods a week. T W or Th F 1:40-4:30. *Rockefeller* 301.

Geometrical optics, lens systems, Gauss points, aberrations, stops, photometry of optical systems; interference, application of various forms of interferometers; Fresnel and Fraunhofer diffraction patterns and their applications to optical measurements; polarized light, production, detection, measurements and applications of plane and elliptically polarized light.

315. *SPECIAL TOPICS IN PHYSICS.* Reading or laboratory work in any branch of Physics under the direction of some member of the staff.

NOTE:—For other courses (primarily for graduate students) see the bulletin board in *Rockefeller Hall*.

PSYCHOLOGY

Mr. H. S. LIDDELL, *Acting Chairman*; Messrs. M. E. BITTERMAN, J. B. COHEN, K. M. DALLENBACH, F. S. FREEMAN, F. L. MARCUSE, T. A. RYAN, and A. L. WINSOR.

For a major in Psychology, the following courses must be completed: (1) in Psychology, twenty-four hours including courses 1 and 3; (2) in related subjects, fifteen hours to be selected in consultation with the adviser from courses in Biology, Chemistry, Mathematics, Music, Philosophy, Physics, and Social Science.

Students who wish to take course 1 or 2, should go, on one of the registration days, to Morrill Hall, north entrance, third floor, for assignment to sections.

1. *ELEMENTARY PSYCHOLOGY.* Fall term. Repeated in spring term. Credit three hours. Not open to freshmen. Mr. DALLENBACH and assistants. Lectures, *Goldwin Smith C. M W 11*. Recitations, one hour a week to be arranged.

This course is a prerequisite for all later courses in Psychology. It deals with the basic problems and principles of human psychology and is designed as a general foundation for the study of experimental, social, animal, and child psychology, for psycho-technology, and for the psychology of the abnormal. Class demonstrations will supplement the lectures and recitations. Textbook: Boring, Langfeld, and Weld. *Introduction to Psychology*.

2. *THE SPECIAL PSYCHOLOGIES.* Fall term. Repeated in spring term. Credit three hours. Lectures, *Goldwin Smith C. T Th 10*. Recitations, one hour a week to be arranged.

A survey of the fields of differential, abnormal, animal, genetic, and social psychology.

3. *INTRODUCTORY LABORATORY.* Fall term. Repeated in spring term. Credit three hours. Prerequisite, Psychology 1. Mr. COHEN. *Morrill 340. M W F 2-4.*

This course is required for all further laboratory work in psychology. It provides elementary training in the methods of experimentation. A representative series of experiments drawn from the field of psychology will be performed by every student.

[4. *INTERMEDIATE COURSE IN PSYCHOLOGY.* One term. Credit three hours. Prerequisite, Psychology 1 and the consent of the instructor. Not given in 1945-46.]

5. *PERCEPTION.* Fall term. Credit three hours. Prerequisite, Psychology 1 and consent of the instructor. Mr. RYAN. *M W F 10. Morrill 340.*

The place of perception in psychology and its relation to every-day living. A review of the important experiments with special emphasis upon recent developments and upon modern theories of perception.

[6. *MEMORY AND THINKING*. One term. Credit three hours. Prerequisite, Psychology 1 and consent of the instructor. Not given in 1945-46.]

[7. *ANIMAL PSYCHOLOGY*. Spring term. Credit three hours. Prerequisite, Psychology 1. One laboratory period to be arranged.

A comparative psychology of the animals based upon a descriptive and experimental account of representative forms. Not given in 1945-46.]

11. *PHYSIOLOGICAL PSYCHOLOGY*. Fall term. Credit three hours. Prerequisite, Psychology 1. Mr. DALLENBACH. T Th S 10. *Morrill* 306.

Lectures and demonstrations on the experimental psychology of behavior, together with a study of the nervous structures involved.

[12. *LEGAL PSYCHOLOGY*. One term. Credit three hours. Prerequisite, Psychology 1. Intended for upperclassmen preparing for law.

Psychological aspects of the origin and growth of the law, and of legal theory; psychological problems of evidence and responsibility. Not given in 1945-46.]

[13. *HISTORY OF EXPERIMENTAL PSYCHOLOGY*. One term. Credit three hours. Prerequisite, senior standing and consent of the instructor. Not given in 1945-46.]

[14. *CONTEMPORARY PSYCHOLOGY*. One term. Credit three hours. Prerequisite, upperclass standing and consent of the instructor.

A comparative study of current psychological theory; existential psychology, behaviorism, Gestalt psychology, psychoanalysis, and horimic psychology. Not given in 1945-46.]

15. *THE NORMAL AND THE ABNORMAL*. Fall term. Credit three hours. Prerequisite, Psychology 1. Mr. LIDDELL. T Th S 11. *Goldwin Smith C.*

The hazards to sanity throughout the life-course. An introduction to the psychological defects and disorders.

19. *MINOR RESEARCH PROBLEMS*. Two terms. Credit three hours a term. Prerequisite, Psychology 1, 3 and special courses required by the instructor. Messrs. BITTERMAN, COHEN, DALLENBACH, LIDDELL, and RYAN.

Research of informal study in general, abnormal, animal, applied, physiological, and social psychology. The course is designed for students majoring in psychology who are prepared to undertake original investigation.

30. *GENERAL PHYSIOLOGICAL PSYCHOLOGY*. Spring term. Credit three hours. Prerequisite, junior standing. Mr. LIDDELL. M W F 11. *Morrill* 340.

The principal biological mechanisms of behavior with special reference to man.

[121. *TECHNIQUE OF EXPERIMENTATION*. One term. Credit three hours. Primarily for graduate students. Hours to be arranged. Not given in 1945-46.]

122. *RESEARCH METHODS IN SOCIAL PSYCHOLOGY*. Spring term. Credit three hours a term. Prerequisite, permission of the instructor. Mr. BITTERMAN. T 2-4. *Seminary Room*.

Primarily a training course, with emphasis on actual laboratory and field experience; individual and group projects. In 1945-46 the work will center about post-war problems.

129. *SEMINAR IN PSYCHOLOGY*. Spring term. Credit three hours. Primarily for graduate students. Hours to be arranged.

SOCIAL PSYCHOLOGY. See INTERDEPARTMENTAL COURSES, p. 92.

132. *ADVANCED ABNORMAL PSYCHOLOGY*. Spring term. Credit three hours. Prerequisite, course 15. Mr. MARCUSE. M W F 12. *Morrill 340*. Intensive study of selected topics.

133. *INFORMAL STUDY AND RESEARCH IN PSYCHOBIOLOGY*. Two terms. Credit hours to be arranged. Prerequisite, consent of the instructor. Mr. LIDDELL. Place and hour to be arranged.

Recent advances in the investigation of the interrelationship of mind and body.

EDUCATIONAL PSYCHOLOGY

EDUCATIONAL PSYCHOLOGY (Education 100b; see *Announcement of the School of Education*). Spring term. Credit three hours. Primarily for prospective teachers. Prerequisite, Human Growth and Development. Other qualified students may be admitted on consent of the instructor. M W F 11. *Goldwin Smith 236*. Mr. FREEMAN.

This course is counted among the 30 hours allowed outside the College of Arts and Sciences.

The major facts and principles of psychology bearing on educational practice and theory.

MENTAL MEASUREMENTS (Education 7). Fall term. Credit three hours. Prerequisite, a course in general or educational psychology, or Human Growth and Development. T Th S 9. *Goldwin Smith 234*. Mr. FREEMAN.

Development of individual and group tests of intelligence and personality; principles underlying their construction and use; their use in schools, psychological clinics, the armed services, and in other fields. The nature of mental abilities. Demonstrations in administering and interpreting tests.

EXPERIMENTAL EDUCATIONAL PSYCHOLOGY (Education 8). Either term. Credit and hours to be arranged. Consent of the instructor is required. Education 7 or its equivalent should precede this course.

The application of psychological and statistical methods to problems in education.

INDIVIDUAL DIFFERENCES (Education 18). Spring term. Credit three hours. Prerequisite, a course in general or educational psychology,

*or Human Growth and Development. It is desirable, though not required, that Education 7 precede this course. T Th 2-3:15. *Goldwin Smith* 248. Mr. FREEMAN.

The nature, causes, and implications of individual differences in abilities and behavior. Study and observations of atypical groups.

SEMINAR IN HUMAN DEVELOPMENT AND BEHAVIOR (Education 20). Spring term. Credit two hours. Primarily for graduate students in Education. Seniors may be admitted with permission of the instructor. M 4-6. *Goldwin Smith* 248. Mr. FREEMAN.

Recent experimental and clinical materials and theories. Educational implications.

PROCEDURES IN CLINICAL CHILD GUIDANCE (Education 25). Fall term. Credit three hours. Primarily for graduate students; a limited number of qualified seniors may be admitted. All students must have consent of the instructor. Mr. FREEMAN. M 4-6 and conferences. *Goldwin Smith* 248.

Procedures and instruments used in case studies of psycho-educational problems of learning and adjustment. Study of case materials. Participation in making actual case studies of pupils.

ROMANCE LANGUAGES

Mr. M. G. BISHOP, *Chairman*; MESSRS. T. G. BERGIN, G. I. DALE, LEWIS GORDON, JOHN IWANIK, LAURENCE PUMPELLY, B. L. RIDEOUT, M. RODRÍGUEZ-DÍAZ, R. B. SMALL, and PIERRE THOMAS.

For a major in French, the following courses must be completed: (1) in French, twenty-one hours of unstarred courses; (2) in related subjects, eighteen hours to be selected from courses in English, History of Art, German, Greek, Ancient and European History, Italian, Latin, Music 21, Philosophy 5, 8, 9, Portuguese, Russian, and Spanish.

For a major in Spanish, the following courses must be completed: (1) in Spanish, twenty-one hours of unstarred courses; (2) in related subjects, eighteen hours to be selected from courses in English, History of Art, French, German, Ancient and European History, Italian, Latin, Music 21, Philosophy 5, 8, 19, Portuguese, and Russian.

For a major in French and Italian, Spanish and Italian. French and Spanish, Spanish and French, the following courses must be completed: (1) in the first language of each pair, fifteen hours of unstarred courses, and in the second language, nine hours of unstarred courses; (2) in related subjects, eighteen hours to be selected from courses in English, History of Art, German, Greek, Ancient and European History, Latin, Music 21, Philosophy 5, 8, 19, Portuguese, Russian, and the Romance language not included in the major.

FRENCH

*1a. *FIRST COURSE*. Fall term. Credit three hours. M W F 12. *Goldwin Smith* 281. Mr. THOMAS.

*1b. *FIRST COURSE* (second term of 1a). Spring term. Credit three hours. M W F 12. *Goldwin Smith* 281. Mr. THOMAS.

*3a. *SECOND COURSE*. Fall term. Credit three hours. M W F 8. *Goldwin Smith* 277. Mr. SMALL. T Th S 10. *Goldwin Smith* 283. Mr. GORDON.

*3b. *SECOND COURSE* (second term of 3a). Spring term. Credit three hours. M W F 8. *Goldwin Smith* 277. Mr. SMALL. T Th S 10. *Goldwin Smith* 277. Mr. GORDON.

6a. *FRESHMAN FRENCH: READING, WRITING, AND SPEAKING*. One term. Credit three hours. Fall term: M W F 9. *Goldwin Smith* 283. Mr. BISHOP. M W F 9. *Goldwin Smith* 290. Mr. RIDEOUT. M W F 10. *Goldwin Smith* 283. Mr. GORDON. M W F 11. *Goldwin Smith* 283. Mr. GORDON. T Th S 9. *Goldwin Smith* 277. Mr. GORDON. Spring term: M W F 12. *Goldwin Smith* 277. Mr. GORDON. Prerequisite, 3b or third-year entrance French.

*6b. *FRESHMAN FRENCH: READING, WRITING, AND SPEAKING* (second term of 6a). One term. Credit three hours. Fall term: M W F 12. *Goldwin Smith* 277. Mr. BISHOP. T Th S 8. *Goldwin Smith* 283. Mr. GORDON. Spring term: M W F 9. *Goldwin Smith* 283. Mr. BISHOP. M W F 9. *Goldwin Smith* 290. Mr. RIDEOUT. M W F 10. *Goldwin Smith* 283. Mr. GORDON. M W F 11. *Goldwin Smith* 283. Mr. GORDON. T Th S 9. *Goldwin Smith* 277. Mr. GORDON.

7a. *WRITTEN AND SPOKEN FRENCH*. Fall term. Credit three hours. T Th S 9. *Goldwin Smith* 281. Mr. THOMAS. Prerequisite, 6b or its equivalent.

7b. *WRITTEN AND SPOKEN FRENCH* (second term of 7a). Spring term. Credit three hours. T Th S 9. *Goldwin Smith* 281. Mr. THOMAS.

9a. *WRITTEN AND SPOKEN FRENCH*. Fall term. Credit three hours. M W F 10. *Goldwin Smith* 281. Mr. THOMAS. Prerequisite, 7b or its equivalent.

9b. *WRITTEN AND SPOKEN FRENCH* (second term of 9a). Spring term. Credit three hours. M W F 10. *Goldwin Smith* 281. Mr. THOMAS.

16a. *HISTORY OF FRENCH LITERATURE*. Fall term. Credit three hours. M W F 11. *Goldwin Smith* 290. Mr. BISHOP. Prerequisite, 6b. The course is conducted in French.

16b. *HISTORY OF FRENCH LITERATURE* (second term of 16a). Spring term. Credit three hours. M W F 11. *Goldwin Smith* 290. Mr. BISHOP.

23. *FRENCH HISTORICAL GRAMMAR*. Fall term. Credit two hours. T Th 10. *Goldwin Smith* 281. Mr. PUMPELLY.

32a. *FRENCH POETRY*. Fall term. Credit two hours. M W 9. *Goldwin Smith* 281. Mr. THOMAS.

32b. *FRENCH POETRY* (second term of 32a). Spring term. Credit two hours. M W 9. *Goldwin Smith* 281. Mr. THOMAS.

ITALIAN

*1a. *FIRST COURSE*. Fall term. Credit three hours. T Th S 11. *Goldwin Smith* 281. Mr. BERGIN.

*1b. *FIRST COURSE* (second term of 1a). Spring term. Credit three hours. T Th S 11. *Goldwin Smith* 281. Mr. BERGIN.

5a. *SECOND COURSE*. Fall term. Credit three hours. M W F 10. *Goldwin Smith* 264. Mr. BERGIN. Prerequisite, 1b or second-year entrance Italian.

5b. *SECOND COURSE* (second term of 5a). Spring term. Credit three hours. M W F 10. *Goldwin Smith* —. Mr. BERGIN.

SPANISH

*1a. *FIRST COURSE*. Fall term. Credit three hours. M W F 8. *Goldwin Smith* 283. Mr. IWANIK. M W F 8. *Goldwin Smith* 290. Mr. RODRÍGUEZ-DÍAZ. M W F 12. *Goldwin Smith* 283. Mr. BERGIN. M W F 12. *Goldwin Smith* 290. Mr. RODRÍGUEZ-DÍAZ. T Th S 10. *Goldwin Smith* 290.

*1b. *FIRST COURSE* (second term of 1a). One term. Credit three hours. Fall term: M W F 12. *Goldwin Smith* 264. Mr. DALE. T Th S 12. *Goldwin Smith* 277. Mr. SMALL. Spring term: M W F 8. *Goldwin Smith* 283. Mr. IWANIK. M W F 8. *Goldwin Smith* 290. Mr. RODRÍGUEZ-DÍAZ. M W F 12. *Goldwin Smith* 283. Mr. BERGIN. M W F 12. *Goldwin Smith* 290. Mr. SMALL. T Th S 10. *Goldwin Smith* 283. Mr. RODRÍGUEZ-DÍAZ.

*3a. *SECOND COURSE*. One term. Credit three hours. Fall term: M W F 9. *Goldwin Smith* 277. Mr. SMALL. M W F 10. *Goldwin Smith* 290. Mr. ———. T Th S 9. *Goldwin Smith* 283. Mr. IWANIK. Spring term: T Th S 11. *Goldwin Smith* 283. Mr. DALE. Prerequisite, 1b or second-year entrance Spanish.

*3b. *SECOND COURSE* (second term of 3a). One term. Credit three hours. Fall term: M W F 11. *Goldwin Smith* 277. Mr. SMALL. Spring term: M W F 9. *Goldwin Smith* 277. Mr. SMALL. M W F 10. *Goldwin Smith* 290. Mr. SMALL. T Th S 9. *Goldwin Smith* 283. Mr. IWANIK.

*6a. *FRESHMAN SPANISH: READING, WRITING, AND SPEAKING*. One term. Credit three hours. Fall term: M W F 9. *Goldwin Smith* 236. Mr. RODRÍGUEZ-DÍAZ. M W F 10. *Goldwin Smith* 277. Mr. IWANIK. T Th S 12. *Goldwin Smith* 283. Mr. BERGIN. Spring term: M W F 11. *Goldwin Smith* 277. Mr. IWANIK. Prerequisite, 3b or third-year entrance Spanish.

*6b. *FRESHMAN SPANISH: READING, WRITING, AND SPEAKING* (second term of 6a). One term. Credit three hours. Fall term: T Th S 11. *Goldwin Smith* 283. Mr. IWANIK. Spring term: M W F 9. *Goldwin Smith* —. Mr. RODRÍGUEZ-DÍAZ. M W F 10. *Goldwin Smith* 277. Mr. IWANIK. T Th S 12. *Goldwin Smith* 283. Mr. BERGIN.

7a. *WRITTEN AND SPOKEN SPANISH*. Fall term. Credit three hours. T Th S 11. *Goldwin Smith* 277. Mr. RODRÍGUEZ-DÍAZ. Prerequisite, 6b or its equivalent.

7b. *WRITTEN AND SPOKEN SPANISH* (second term of 7a). Spring term. Credit three hours. T Th S 11. *Goldwin Smith* 277. Mr. RODRÍGUEZ-DÍAZ.

8a. *SPOKEN SPANISH*. Fall term. Credit one hour. W 4. *University Library, French and German Seminary*. Messrs. DALE and RODRÍGUEZ-DÍAZ.

8b. *SPOKEN SPANISH*. Spring term. Credit one hour. W 4. *University Library, French and German Seminary*. Messrs. DALE and RODRÍGUEZ-DÍAZ.

11a. *SURVEY OF SPANISH-AMERICAN LITERATURE*. Fall term. Credit three hours. M W F 11. *Goldwin Smith* 281. Mr. DALE.

11b. *SURVEY OF SPANISH-AMERICAN LITERATURE* (second term of 11a). Spring term. Credit three hours. M W F 11. *Goldwin Smith* 281. Mr. DALE.

17a. *CERVANTES*. Fall term. Credit three hours. T Th S 10. *Goldwin Smith* 277. Mr. DALE.

17b. *CERVANTES* (second term of 17a). Spring term. Credit three hours. T Th S 10. *Goldwin Smith* 281. Mr. DALE.

SCANDINAVIAN LANGUAGES AND LITERATURES

MR. HALLDOR HERMANSSON.

For a major in Scandinavian Languages and Literatures, the following courses must be completed: (1) in Scandinavian Languages and Literatures, courses 1 and 3 or 4, and six other hours; (2) related subjects, twenty-two hours to be selected from approved courses in German, English, History, Comparative Study of Literature, Greek, Latin, and Sociology and Anthropology.

1. *OLD ICELANDIC*. Throughout the year. Credit three hours a term. Mr. HERMANSSON. T Th S 11. *Goldwin Smith* 220.

[2. *MODERN ICELANDIC*. Spring term. Credit three hours. Mr. HERMANSSON. Not given in 1945-46.]

3. *DANISH AND DANO-NORWEGIAN*. Fall term. Credit three hours. Mr. HERMANSSON. T Th S 12. *Goldwin Smith* 245.

[4. *SWEDISH*. Fall term. Credit three hours. Mr. HERMANSSON. Not given in 1945-46.]

5. *OLD NORSE-ICELANDIC LITERATURE*. Fall term. Credit two hours. Mr. HERMANSSON. W F 12. *Goldwin Smith* 245.

[6. *MODERN SCANDINAVIAN LITERATURE*. Spring term. Credit two hours. Mr. HERMANSSON. Not given in 1945-46.]

[7. *EARLY SCANDINAVIAN CIVILIZATION AND HISTORY*. Spring term. Credit two hours. Mr. HERMANSSON. Not given in 1945-46.]

SLAVIC

Mr. ERNEST J. SIMMONS, *Chairman*; Messrs. P. A. PERTZOFF, L. N. STILMAN, and Mrs. G. A. STILMAN.

For major work in Slavic, a student is required to complete forty-eight hours, twelve of which may be in related subjects. Slavic 1, 2, 3 (or the equivalent), and Slavic 5 are required. Related courses should be selected, in consultation with an adviser, from the general field of the humanities.

Tutorial work will be a regular part of the major study in Slavic.

Language courses will be given in the first term and repeated in the second, if the demand justifies it.

1. *ELEMENTARY RUSSIAN*. Fall term. Credit six hours. By appointment.

2. *INTERMEDIATE RUSSIAN*. Fall term. Credit six hours. By appointment.

3. *ADVANCED RUSSIAN*. Fall term. Credit six hours. By appointment.

5b. *INTRODUCTION TO RUSSIAN LITERATURE AND CULTURE*. Fall term. Credit three hours. Mr. SIMMONS. M W F 10. *Goldwin Smith* 134.

Lectures on the principal literary and artistic monuments of Russia. A series of illustrated lectures on Russian art and architecture will be a regular part of the course. All reading will be in English translations.

6. *PUSHKIN*. Fall term. Credit three hours. Mr. SIMMONS. T Th S 10. *Goldwin Smith* 134.

Representative readings of Pushkin's poetry and prose. Prerequisite, second-year Russian or the consent of the instructor.

7. *DOSTOEVSKI*. Spring term. Credit three hours.

8. *SOVIET LITERATURE*. Spring term. Credit three hours.

20. *ELEMENTARY INTENSIVE RUSSIAN*. Fall term. Credit twelve hours. Mr. STILMAN and others. M through S 11, and six hours a week to be arranged. *Goldwin Smith* 242.

30. *ADVANCED INTENSIVE RUSSIAN*. Fall term. Credit twelve hours. Mr. STILMAN. M through S 12, and six hours a week to be arranged. *Goldwin Smith* 134.

SOCIOLOGY AND ANTHROPOLOGY

Mr. L. S. COTTRELL, JR., *Chairman*; Mr. LOUIS GUTTMAN, Miss SHIRLEY LETWIN, and Mr. R. L. SHARP.

[For a major in Sociology and Anthropology the following courses must be completed: (1) twenty-one hours in Sociology and Anthropology, in addition to Sociology 2, Social Science B, or equivalent; (2) twenty-one hours in related subjects, to be chosen with the approval of the adviser. The major may emphasize social and personnel work, social psychology, community organization and planning, statistics, or anthropology.]

[2. *INTRODUCTION TO SOCIOLOGY AND ANTHROPOLOGY*. Fall term. Credit three hours. Not open to freshmen or to those who have credit for Social Science B. M W F 10, 12; T Th S 9, 10. *McGraw* 201.]

The role of cultural factors in shaping personality; the behavior of crowds, races, nations, social classes, and publics; the social organization of rural and urban communities. Not given in 1945-46.]

[3. *MAN AND CULTURE*. Spring term. Credit three hours. T Th S 10. *McGraw* 201. Mr. SHARP.]

An introduction to physical and cultural anthropology. Topics include: human origins, evolution, and racial differentiation; the prehistoric development of cultures; factors involved in long-term cultural change. Not given in 1945-46.]

10. *THE FAMILY*. Spring term. Credit three hours. Prerequisite, Social Science B, Sociology 2, or equivalent. T Th S 8. *McGraw* 201. Mr. COTTRELL.]

The development of the family as a social institution in modern society; the relation between cultural changes and changes in the family pattern; the social psychology of intra-family relationships.

20. *SOCIAL PATHOLOGY*. Fall term. Credit three hours. Prerequisite, Sociology 2, Social Science B, or equivalent. T Th S 10. *McGraw* 201. Miss LETWIN.]

Social and personal disorganization in modern urban society; programs and agencies that aim at social reorganization.

[21. *CRIMINOLOGY*. Fall term. Credit three hours. T Th S 11. *McGraw* 201. Not given in 1945-46.]

A study of the various factors making for law violation and of society's methods for dealing with the criminal and the juvenile delinquent.

SOCIAL PSYCHOLOGY. Two terms. Credit three hours a term. Prerequisite, Sociology 1, Sociology 2, Social Science B, or permission of the instructor. See interdepartmental courses.

[40. *POPULATION PROBLEMS*. One term. Credit three hours. Prerequisite, Sociology 2, Social Science B, or equivalent.]

Population growth, distribution, and migration; the problem of population quality; problems of race relations; population changes resulting from the war. Not given in 1945-46.]

[41. *URBAN SOCIETY*. Fall term. Credit three hours. Prerequisite, Sociology 2, Social Science B, or equivalent. T Th S 10. *McGraw* 201.

A study of the city as a social organization. History and present patterns of city developments. Urban attitudes and customs. Not given in 1945-46.]

[42. *SOCIAL PLANNING*. One term. Credit three hours. Prerequisite, consent of instructor. Sociological aspects of home, neighborhood, city, and regional planning. Not given in 1945-46.]

[60. *SOCIAL ANTHROPOLOGY*. Two terms. Credit three hours a term. M W F 11. *McGraw* 201. Mr. SHARP.

Problems in the comparative and historical study of cultures, both primitive and complex: environments and technologies; social structures, familial, political, economic, religious, and associational; ritual and symbolic behavior; culture and personality; cultural interests and the problems of divergent interests within and between cultures. Not given in 1945-46.]

[64. *CULTURES OF ASIA*. One term. Credit three hours.

A study of the cultures of representative ethnic groups in eastern Asia, including India and Indonesia, their origins, relationships with each other, and reactions to Western Civilization. Not given in 1945-46.]

70. *INTRODUCTION TO STATISTICS*. Fall term. Credit three hours. Not open to freshmen. M F 2 and an hour to be arranged. *McGraw* 201. Mr. GUTTMAN.

A descriptive course on elementary principles and methods for the systematic collection, presentation, and interpretation of statistics. For students who desire only one course in statistics, this course will provide an acquaintance with the principal sources of statistics, a knowledge of the major uses of statistics, and a critical understanding of elementary methods of analysis and statistical reasoning.

71. *METHODS OF STATISTICAL ANALYSIS*. Two terms. Credit four hours a term. Prerequisites: for the first term, Mathematics 65a, 30, or equivalent, or enrollment therein; for the second term, Mathematics 65b, or equivalent, or enrollment therein. M F 9 and hours to be arranged.

The analysis of frequency distributions of qualitative and quantitative variables: graphic representation, averages, dispersion, sampling and tests of significance, analysis of variance, regression, correlation, elementary multivariate analysis—including the problem of index numbers in economics and of scale construction in sociology and psychology.

100. *INFORMAL STUDY*. Hours and credit to be arranged. Open to senior Sociology majors.

[160. *RESEARCH SEMINAR IN ANTHROPOLOGY*. Hours and credit to be arranged. Not given in 1945-46.]

172. *SEMINAR: ADVANCED STATISTICAL METHODS*. Spring term. Credit two hours. Prerequisite, Sociology 71 or equivalent.

The topic or topics for the seminar will be decided by a consensus of the students. The theory of statistical inference (fundamental sampling problems), multiple factor analysis; reliability and validity of scales, the theory of statistical prediction, and other topics are among those that might be chosen.

SPEECH AND DRAMA

Mr. H. A. WICHELS, *Chairman*; Messrs. H. D. ALBRIGHT, A. M. DRUMMOND, C. K. THOMAS, and R. H. WAGNER.

Students may elect a general major, or a major with emphasis on (1) Rhetoric and Public Speaking, (2) Phonetics and Speech Training, (3) Dramatic Production. The following courses must be completed: (1) in the Department, twenty-one hours including nine hours from courses 1, 2, 10 (or 40), 32; (2) in related subjects, six hours of courses not taken in the freshman year in each of the following groups—(a) English (b) History, Government, Economics, Sociology; (c) Philosophy. Of this total of thirty-nine hours, twenty-four must be in unstarred courses.

Students planning to teach Speech should satisfy the basic requirements for teachers of English. For those preparing to teach English the Department recommends fifteen to eighteen hours in Speech and Drama including courses 1, 10 (or 40), 32, 41.

PUBLIC SPEAKING: ORAL READING

*1. *PUBLIC SPEAKING*. Fall term. Repeated in spring term. Credit three hours. Not open to freshmen. Messrs. WAGNER, WICHELS, and assistants. M W F 9, 10, 11, 12; T Th S 9, 10, 11. *Goldwin Smith 21.*

The fundamentals of speech; emphasis on speech preparation and on direct, communicative delivery. Study of principles; constant practice; conferences.

Foreign students and others whose pronunciation of English falls below the normal standard, and students with special vocal problems, are advised to confer with Mr. THOMAS before registering.

*2. *PUBLIC SPEAKING*. Spring term. Credit three hours. Prerequisite, course 1. Mr. WAGNER. T 11, Th 11-1. *Goldwin Smith 221.*

Practice in the composition and delivery of various types of speeches, mainly persuasive in purpose; some work in parliamentary procedure and in committee and forum discussion. Study of principles of interest and persuasion.

[7. *DISCUSSION*. Mr. WAGNER. Not given in 1945-46.]

*10. *ORAL INTERPRETATION OF LITERATURE*. Fall term. Repeated in spring term. Credit three hours. Not open to freshmen. Mr. WICHELS. Fall term: M W F 10; spring term: M W F 12. *Goldwin Smith 234.*

Study, for understanding and appreciation, of poetry and prose selected from the best English and American writers; practice in reading aloud; conferences, drill.

11. *ORAL INTERPRETATION OF LITERATURE*. Spring term. Credit three hours. Prerequisite, course 10. Mr. WICHELS. M W F 10. *Goldwin Smith* 234.

12. *ARGUMENT AND DEBATE*. Fall term. Credit three hours. Prerequisite, course 1 or consent of the instructor. Mr. WAGNER. T 11, Th 11-1. *Goldwin Smith* 221.

Practice in argumentative speaking and debating on current problems; study of principles; conferences.

[13. *ARGUMENT AND DEBATE*. Mr. WAGNER. Not given in 1945-46.]

[16. *FORMS OF PUBLIC ADDRESS*. Mr. WICHELS. Not given in 1945-46.]

[21. *HISTORY OF PUBLIC ADDRESS*. Mr. WICHELS. Not given in 1945-46.]

[23. *THEORIES OF PUBLIC ADDRESS*. Mr. WAGNER. Not given in 1945-46.]

25. *BRITISH ORATORS*. Fall term. Credit three hours. Open to upper-classmen by consent of the instructor. Mr. WAGNER. T 2-4:30. *Goldwin Smith* 245.

A study of leading British orators from the sixteenth century to the present. Lectures; readings; and reports.

The Department calls attention to three prizes in Public Speaking, competition for which will be open in the spring term: the Woodford Prize, for seniors; the Class of 1894 Memorial Prize in Debate, for juniors and seniors; and the Class of 1886 Memorial Prize in Public Speaking, for sophomores and juniors.

SPEECH TRAINING AND PHONETICS

*30. *VOICE TRAINING*. Fall term. Repeated in spring term. Credit two hours. Open to freshmen. Mr. THOMAS. T Th 10 and an hour to be arranged. *Goldwin Smith* 26.

32. *ENGLISH PHONETICS*. Fall term. Credit three hours. Not open to freshmen. Mr. THOMAS. T Th S 11. *Goldwin Smith* 236.

Principles of phonetics; study of English pronunciation, based chiefly on contemporary American usage; practice in phonetic analysis and, where necessary, drill for the improvement of individual speech.

[33. *REGIONAL AND HISTORICAL PHONETICS*. Mr. THOMAS. Not given in 1945-46.]

34. *PRINCIPLES OF LINGUISTICS*. Spring term. Credit three hours. Mr. THOMAS. T Th S 11. *Goldwin Smith* 236.

Methods of comparative and historical study, with special reference to

the phonetic, structural, and developmental principles of English. Text: Bloomfield, *Language*.

[36. *PRINCIPLES OF SPEECH CORRECTION*. Mr. THOMAS. Not given in 1945-46.]

SPEECH CLINIC. For students working under the direction of the Department.

DRAMATIC PRODUCTION

*40. *DRAMATIC INTERPRETATION*. Spring term. Credit three hours. For freshmen and sophomores. Mr. ALBRIGHT. M W F 10. *Morse*, Stage Laboratory.

Analysis and interpretative reading of various types of dramatic prose and poetry; principles of stage presentation; reports, individual exercises, and group rehearsal.

Students wishing to enroll should consult the instructor before February 15.

41. *DRAMATIC PRODUCTION: DIRECTION*. Fall term. Credit three hours. Open by consent of the instructor; not open to freshmen. Mr. ALBRIGHT. M W F 11. *Morse*, Stage Laboratory.

Dramatic interpretation and the related principles of stage direction and production. Lectures, readings, reports, and drill.

42. *ADVANCED DRAMATIC INTERPRETATION*. Spring term. Credit three hours. For graduates and, by consent of the instructor, for upperclassmen majoring in the Department. Mr. DRUMMOND. W 2-4. *Morse Hall*, Rehearsal Room.

44. *ADVANCED DRAMATIC PRODUCTION*. Fall and spring terms. Credit three hours a term. Mr. DRUMMOND and Mr. ALBRIGHT. For graduates and approved seniors. T 2-4, and hours to be arranged. *Morse* Stage Laboratory.

Laboratory study and practice in the production of plays.

45. *DRAMATIC PRODUCTION: STAGECRAFT*. Spring term. Credit three hours. Open by consent of the instructor; not open to freshmen. Mr. ALBRIGHT. M W 12; T 1:40-4, or as arranged. *Morse*, Stage Laboratory.

The theory and practice of stage production; planning of small theatres; stage arrangement; problems and practice in scene construction, design, and elements of lighting. Lectures, demonstrations, reports.

45a. *DRAMATIC PRODUCTION: STAGE LIGHTING*. Fall term. Credit two hours. Open by consent of the instructor to graduates and upperclassmen. Mr. ALBRIGHT. T 1:40-4, or as arranged. *Morse*, Stage Laboratory.

48b. *AMERICAN DRAMA AND THEATRE*. Spring term. Credit three hours. Open to upperclassmen. Mr. DRUMMOND. M W F 11. *Goldwin Smith B.*

A study of the American theatre and of the principal American plays, with special emphasis on the drama as an expression of the national life and culture.

49. *PLAYWRITING*. Fall term. Credit three hours. Mr. DRUMMOND. Th 2-4, and an hour to be arranged. *Goldwin Smith 242*.

66. *THEORIES OF DRAMATIC PRODUCTION*. Fall term. Credit three hours. Primarily for graduates; open to seniors by consent of the instructor. Mr. DRUMMOND. T Th 12. *Goldwin Smith 242*.

90. *THEATRE PRACTICE*. Fall and spring terms. Credit two hours a term. Open by consent of the instructor to juniors who have taken or are taking Speech and Drama 40, 41, or 45, or who have a satisfactory record of applied work in techniques in the University Theatre. Hours to be arranged. Mr. ALBRIGHT.

Projects in the productions of the University Theatre.

91. *THEATRE PRACTICE*. Fall and spring terms. Credit two hours a term. Open by consent of the instructor to seniors who have taken Speech and Drama 40, 41, or 45, or who have a satisfactory record of applied work in techniques in the University Theatre. Mr. ALBRIGHT. Hours to be arranged.

Projects in the productions of the University Theatre.

The Department calls the attention of students interested in Dramatic Production to the courses listed under The Fine Arts and to English 23, 24, 48, 150. Three prizes in Playwriting are offered under the auspices of the Department in 1945-46: the Heermans Prize for One-Act Plays on an American Theme; the University Theatre Prize for New York State Regional Plays (open both to graduates and undergraduates); and the Cornell Dramatic Club Prize (no restriction as to theme).

ZOOLOGY

Mr. H. B. ADELMANN, *Chairman*; Mr. A. A. ALLEN, MESSRS. P. W. GILBERT, D. R. GRIFFIN, W. J. HAMILTON, F. B. HUTT, P. P. KELLOGG, S. L. LEONARD, Miss AMY G. MEKEEL, MESSRS. J. W. PAPEZ, E. C. RANEY, G. M. SUTTON, W. A. WIMSATT, A. H. WRIGHT, and B. P. YOUNG.

For a major in Zoology there must be completed: (1) Zoology 1 and eighteen other hours selected from Zoology 8, 9, 11, 30, 101, 104, 223, and Physiology 303, and (2) fifteen hours in related fields selected from Chemistry, Biochemistry, Physics, Psychology, Entomology, Botany, Geology, Plant Breeding 101, and Bacteriology.

Choice of all courses should be made at a conference with the adviser.

Students who are planning to study medicine should make sure that they select a major that will include the entrance requirements of the medical school of their choice. Information as to advisers and entrance requirements to medical schools may be obtained at the Office of Professor L. L. Barnes, Rockefeller Hall.

Provisions are made for a limited number of students to undertake informal study.

Courses 1a and 1b, or their equivalent, are a prerequisite for all other courses in the department except 8 and 9.

1a, 1b. *INTRODUCTORY ZOOLOGY*. Two terms. Credit three hours a term. If taken after General Biology 1, credit two hours a term.

1a. *AN INTRODUCTION TO THE INVERTEBRATES*. Mr. YOUNG and assistants. Lectures: T Th 9. *Stimson* G25. One laboratory period weekly. M T W Th or F 1:40-4 or S 9-11:20. *Stimson* 104 and 116.

Course deals with the structure and body functions of representative animals lacking backbones; their classification and habits; where and how they live; and their relations to one another and to the welfare of man.

1b. *AN INTRODUCTION TO THE VERTEBRATES*. Mr. LEONARD and assistants. Lectures T Th 9. *Stimson* G1. One laboratory period weekly. T W Th 1:40-4. *Stimson* 102.

A survey of the anatomy and physiology of the vertebrate organ systems, biological principles, and evolution.

8. *ELEMENTARY TAXONOMY AND NATURAL HISTORY OF VERTEBRATES*. Throughout the year. Credit three hours a term. Lecture, M 8. *Stimson* 225. Laboratory, M W 1:40-4 or T Th 1:40-4. *Stimson* 225. Messrs. WRIGHT and RANEY.

Lectures on fishes, amphibia, reptiles, birds and mammals, dealing with the principles of classification and nomenclature, characteristics, relationships, and bionomics of these groups. The laboratory gives practice in the identification of North American species. Field studies of the local fauna are undertaken during the fall and spring. During May, field trips will be taken at 5:30 A.M.

9. *GENERAL ORNITHOLOGY*. Spring term. Credit three hours. Messrs. ALLEN and KELLOGG. Lecture, W 11. *Fernow* 122. Field work and laboratory, M W 1:40-4 or T Th 1:40-4. *Fernow* 210.

Introduction to the study of birds, particularly the local species; their songs and habits; designed to give a working knowledge to those wishing to study birds as an avocation, and fundamental to those planning advanced work in ornithology. Laboratory work with bird skins is based on the field work.

11. *COMPARATIVE ANATOMY OF VERTEBRATES*. Throughout the year. Credit three hours a term. Mr. GILBERT and assistants. Lecture, M 10. *Stimson* G25. Two laboratory periods weekly: M F 1:40-4; T Th 8-10:30; T Th 1:40-4. *Stimson* 310.

A thorough study and dissection of representative vertebrate types including a fish, amphibian, reptile, bird, and mammal, together with demonstrations on species other than the types dissected.

16. *INVERTEBRATE ZOOLOGY*. Throughout the year. Credit three hours a term. Mr. YOUNG. Lecture, W 8. *Stimson* G-1. Laboratory, T Th 1:40-4, *Stimson* 116.

Lectures and laboratories stress the bionomics, morphology, development, and phylogeny of the invertebrates. Certain taxonomical and physiological aspects of the major groups are also considered. A limited number of field trips are undertaken during the fall and spring.

22. *ICHTHYOLOGY, ADVANCED SYSTEMATIC AND FIELD ZOOLOGY*. Spring term. Credit three hours. Messrs. WRIGHT and RANEY. Lectures, T Th 8. *Stimson* G25. Laboratory, F 1:40-4 or S 8-10:30. *Stimson* 225.

An amplification of the prerequisite course 8. In the lectures, special emphasis is laid on the principal phases of fish life; the taxonomy, origin, and evolution of fossil and living groups; geographical distribution; and the literature and institutions of zoology. Laboratory periods are devoted to the identification of exotic and indigenous forms.

[23. *HERPETOLOGY*. Spring term. Credit three hours. Mr. WRIGHT. Lecture, T Th 8. *Stimson* G25. Laboratory, F 1:40-4 or S 8-10:30. *Stimson* 225.

An amplification of the prerequisite course 8. The lectures are devoted to the taxonomy, origin, and evolution of living amphibia and reptiles, and to their geographical distribution. Laboratory periods will be devoted to the identification of exotic and indigenous forms.]

25. *MAMMALOLOGY*. Fall term. Credit three hours. Mr. HAMILTON. Lectures, T Th 8. *Stimson* G25. Laboratory, F 1:40-4 or S 8-10:30. *Stimson* 225.

Discussion of principal phases of mammalian life; origin, distribution, habits, and literature. Laboratory periods are devoted to methods of field collecting, census taking, life history studies, preparation of skins and skeletons, and identification of North American species.

30. *HEREDITY AND EUGENICS*. Fall term. Credit two hours. Mr. HURT. Lectures, W F 10. *Rice* 201.

The laws of heredity; a survey of inherited characters in man; biological principles applicable to betterment of the human race.

67. *SEMINAR IN SYSTEMATIC VERTEBRATE ZOOLOGY*. Fall term. Credit one hour. Mr. WRIGHT. T 7:30 P.M. *Stimson* 225.

Life-zone plans of North America. Distribution and origin of life in North America. Zoogeography of the Old World. Animal coloration. Other topics, to be announced.

101. *THE TISSUES: HISTOLOGY AND HISTOGENESIS*. Fall term. Credit four hours. Mr. WIMSATT and assistants. Lectures, T Th 11. *Stimson* G1. Laboratory, Section I, T Th 8-11; Section II, T Th 1:40-4. *Stimson* 206.

A general survey of the structure and development of the tissues. The treatment is general, designed to provide students of biology with a basis for the understanding of normal and abnormal structure of the vertebrate. Each student will prepare and receive a series of typical microscopic preparations.

102. *THE ORGANS: HISTOLOGY AND DEVELOPMENT*. Spring term. Credit four hours. Prerequisite, course 101 or its equivalent. Mr.

WIMSATT and assistants. Lectures, W F 10, *Stimson* G1. Laboratory, W F 1:40-4. *Stimson* 206.

A continuation of course 101. Courses 101 and 102 together give the fundamental facts of the microscopic structure and development of the body. There is also offered opportunity to gain knowledge of technique in the fixing, embedding, and sectioning of selected organs.

104. *VERTEBRATE EMBRYOLOGY*. Spring term. Credit five hours. Messrs. ADELMANN, WIMSATT, and assistants. Lectures, T Th 11 and lecture or conference, S 10. *Stimson* G1. Laboratory, Section I, T Th 8-11; Section II, T Th 1:40-4. *Stimson* 206.

An introduction to general vertebrate embryology designed to provide a basis for the appreciation of biological problems. The material is treated comparatively with particular emphasis on the development of the amphibian, the bird, and the mammal. A few invertebrate forms are used where desirable for illustration.

112. *LITERATURE OF ECONOMIC ZOOLOGY, CONSERVATION, AND ECOLOGY*. Spring term. Credit one hour. Upperclassmen and graduate students only. Mr. WRIGHT. T 7:30 P.M. *Stimson* 225.

The literature of economic zoology, ecology, limnology, oceanography, and kindred fields; fish and fisheries; amphibia, reptiles, and mammals; small and big game (commercial and sport); aquaria; zoological gardens, preserves; game farms, animals in relation to recreation, settlement, forestry, agriculture, and other industries; biologic resources, their exploration, conservation, utilization, and management.

126. *ADVANCED ORNITHOLOGY*. Fall term. Credit three hours. Prerequisite, permission to register. Mr. ALLEN. Lecture, W 11. *Fernow* 210. Laboratory, T Th 1:40-4. *Fernow* 210.

The structure and classification of birds; geographical distribution; the literature and institutions of ornithology; identification of representative birds of the world. The first part of the term is devoted to field work on the fall migration, and to the identification of birds in winter plumage. Designed primarily for students specializing in ornithology or animal biology.

136. *SEMINAR IN ORNITHOLOGY*. Throughout the year. M 7:30-9. Open to qualified undergraduates and required of all graduate students in Ornithology. Without credit. *Fernow* Seminar Room.

140. *EXPERIMENTAL ENDOCRINOLOGY*. Fall term. Credit two or three hours. Open only to a limited number of qualified graduate students. Mr. LEONARD. Lecture, M F 11, two hours credit. Laboratory one credit hour at time to be arranged. *Stimson* 308.

Lectures on comparative gross and microscopic anatomy of endocrine glands, and their physiology in the light of recent researches. The lectures in this course will cover the comparative anatomy (both gross and microscopic) of the vertebrate endocrine glands from the evolutionary and experimental view point. There will also be included the morphological and biochemical effects of the hormones, particularly the interglandular relation-

ships centered around the pituitary gland. The bio-assay method of hormones will be given. The course will serve to prepare a student for research in this field or related fields, and to introduce him to the terminology and literature of the subject.

221. *STRUCTURE OF THE HUMAN BODY*. Spring term. Credit three hours. Prerequisite, six or more hours of Animal Biology and consent of the instructor. Mr. PAPEZ and instructors. Lectures, M W F 11, and one demonstration at an hour to be arranged. *Stimson* 324.

For students interested in nursing, dentistry, etc., or those wishing to obtain a knowledge of the structure of their own bodies. Illustrated by specimens and lantern slides.

223. *PHYSICAL ANTHROPOLOGY AND HUMAN EVOLUTION*. Fall term. Credit three hours. Mr. PAPEZ and instructors. M W F 11. *Stimson* 324.

Eras of vertebrate evolution, with special reference to the primates; prehistoric man; physical anthropology; and modern races and peoples.

225. *COMPARATIVE NEUROLOGY*. Spring term. Credit three hours. Mr. PAPEZ. Prerequisite, six hours of Zoology. T Th 8-11. *Stimson* 324.

A comparative study of the vertebrate nervous system based on dissections of brains of rabbit and dog, and study of sections of the brain stem of the cat and monkey.

400. *RESEARCH PROBLEMS*. Ordinarily limited to seniors only. Credit to be arranged. Problems may be undertaken in any phase of zoology, but the consent of the instructor concerned is a prerequisite.

ADDITIONAL COURSES IN BIOLOGICAL SCIENCE

BIOLOGY

1. *GENERAL BIOLOGY*. Two terms. Credit three hours a term; both terms of the course must be completed to obtain credit, unless the student is excused by the department. First term not prerequisite to second. Not open to students who have had both Zoology 1 and Botany 1. If Biology 1 is taken after either Zoology 1 or Botany 1, credit two hours a term. Mr. HOOD and assistants.

An elementary course planned to meet the needs of students majoring outside the plant and animal sciences; particularly adapted as the first year of a two-year sequence in biology for the prospective teacher of general science in the secondary schools. The course deals with the nature of life, life processes, the activities and origin of living things. It covers the organization of representative plants and animals, including man as an organism, and the principles of nutrition, growth, behavior, reproduction, heredity, and evolution.

[5. *LABORATORY METHODS IN BIOLOGY*. One term. Credit two or three hours. Prerequisite, Biology 1 or Zoology 1 and permission to register.

For students who intend to teach or to follow some phase of biology as a profession. This course includes such subjects as: laboratory equipment;

collection, preservation, and storage of materials; sectional and nonsectional preparations of animal tissues for histological study; injection of blood vessels and embalming; preparation of bird and mammal skins for study; chart making; introduction to photography; including the preparation of lantern slides; use of micro-projector; theory and use of 16-millimeter sound and silent projection apparatus. Not given in 1945-46.]

BIOCHEMISTRY

For a major in Biochemistry, the following courses must be completed: (1) in Biochemistry, courses 320 and 321, or 322 and 323; (2) in related subjects, Physiology 303, Chemistry 102 or 104, 210, 375, and nine hours of electives.

314. *ELEMENTARY BIOCHEMISTRY*. First term. Credit three hours. Prerequisite, Chemistry 375 or the equivalent. Mr. WILLIAMS and Mr. LAWRENCE. Lectures, M W 12; conferences, F 12. *Dairy Industry Building*.

The substances met with in living things, and the chief facts of digestion, metabolism, and nutrition.

314a. *LABORATORY WORK IN BIOCHEMISTRY*. First term. Credit two hours. Prerequisite or parallel course, Biochemistry 314. Mr. WILLIAMS and Mr. LAWRENCE. M W 1:40-4. *Dairy Industry Building*.

325. *ADVANCED AND RESEARCH WORK IN BIOCHEMISTRY*. Throughout the year. Credit two or more hours. Prerequisite, Animal Biology 314 and 314a. Mr. ————. Hours to be arranged. *Dairy Industry Building*.

For additional courses see the Announcement of the Graduate School.

ENTOMOLOGY

12. *GENERAL ENTOMOLOGY*. First term. Credit three hours. Prerequisite, General Biology 1, Zoology 1, or Botany 1. Lectures, W F 9. *Comstock* 245. Mr. MATHESON. Practical exercises, T W Th or F 1:40-4, or S 8-10:30. *Comstock* 200. Mr. MATHESON and Miss WHYTE.

Lectures on the characteristics of orders, suborders, and the more important families, and on the habits of representative species; practical exercises in studying the structure of insects, their biology, their habits, and their classification.

51. *PARASITE AND PARASITISM*.

52. *MEDICAL ENTOMOLOGY*.

For details of these courses and of others in economic zoology, entomology, and limnology offered in the College of Agriculture, see the announcement of that college.

PHYSIOLOGY

*303. *HUMAN PHYSIOLOGY*. Either term. Credit three hours. Mr. DYE. Lectures, demonstrations, and discussion periods. M W F 10. *Moore Laboratory* 101.

An introductory course designed particularly for those students who intend to take only one course in physiology, for those who expect to teach biology

in the secondary schools, and for those who desire a general knowledge of the physiological processes of the human body.

305. *ENDOCRINOLOGY AND METABOLISM*. Fall term. Credit three hours. Mr. DYE. M W F 11. Prerequisite, six or more hours each of biology and chemistry. *Moore Laboratory 101*. Study of digestion, metabolism, endocrinology, and reproduction.

306. *LABORATORY IN PHYSIOLOGY*. Spring term. Credit three hours. Registration by permission. Mr. DYE and assistants.

Selected experiments on man and other mammals, covering the neuromuscular system, blood, lymph, circulation, respiration, digestion, and excretion. Conference, T 9; Laboratory, F 8-1 or S 8-1.

INTERDEPARTMENTAL COURSES

The course listed below is offered cooperatively by the Department of English and the Department of Speech and Drama.

A, B. *ORAL AND WRITTEN EXPRESSION*. Fall and spring terms. Credit three hours a term. For freshmen. Messrs. WICHELS, THOMPSON, and assistants. M W F 8, 9, 10, 12; T Th S 9, 10. Rooms to be announced.

Training in reading, writing, and speaking. The object is to increase the student's ability to write and to speak clear, orderly, and idiomatic English, and to understand accurately the written and the spoken thought of others.

Students who pass the course will have satisfied group I of the prescribed subjects and may elect sophomore courses in English and courses in Public Speaking which follow Public Speaking 1.

The following course is offered cooperatively by the Department of Zoology and the School of Education

A, B. *HUMAN GROWTH AND DEVELOPMENT*. Fall and spring terms. Not open to freshmen. Credit three hours a term. Prerequisite, a laboratory science, preferably general biology or zoology. Course A is prerequisite to Course B.

The aim of this course is to integrate information about structural, physiological, behavioral, and intellectual aspects of growth and development. Emphasis is placed on those aspects of growth and development that will help educators to understand human individuals as functioning organisms in a social environment. The materials of the course are selected from pertinent fields, including anatomy, embryology, genetics, neurology, physiology, hygiene, sociology, cultural anthropology, developmental psychology, and education.

Fall Term:

Course A. Mr. PAPEZ. Lectures, T Th 10. Recitations, S 10 and another hour to be arranged. *Stimson G25*.

Course B. Mr. FREEMAN. Lectures T Th 11. Recitations S, 11 and another hour to be arranged. *Goldwin Smith A*.

Spring Term:

Course B. Mr. FREEMAN. Lectures, T Th 10. Recitations, S 10 and another hour to be arranged. *Goldwin Smith A.*

Social Science. The Courses A, B, C, D are offered cooperatively by the Departments of Economics, Government, and Sociology and Anthropology. They are designed for students who desire a general introductory course in social science.

A, B. *INTRODUCTION TO SOCIAL SCIENCE.* Course A is a prerequisite to course B. Credit three hours a term. M W F 10. *Goldwin Smith 227 and Goldwin Smith 242.* T Th S 11 *Goldwin Smith 234.* M W F 12 *Goldwin Smith 234 and Goldwin Smith 242.*

A study of the social organization of communities and of nations, designed to introduce the students to the fields of economics, government, sociology, and anthropology. Attention will be directed successively toward (1) a primitive community, (2) the New England town of the seventeenth century, (3) modern communities, urban and rural, and (4) the nation as a form of social organization.

[C. D. *INTRODUCTION TO SOCIAL SCIENCE.* Not given in 1945-46.]

This course is offered cooperatively by the Departments of Psychology and Sociology

SOCIAL PSYCHOLOGY. Two terms. Credit three hours a term. Prerequisite, one of the following: Psychology 1, Sociology and Anthropology 2, Social Science B, or permission of the instructors. First term, Mr. BITTERMAN. Second term, Mr. COTTRELL. M W F 11. *McGraw 201.*

(An interdepartmental course. Given in place of courses formerly listed as: Psychology 9 and 10 and Sociology and Anthropology 30.)

UNIVERSITY REQUIREMENTS FOR THE DEGREE A.B. MILITARY SCIENCE AND TACTICS

1. *BASIC COURSE.* Required. Throughout the year. The complete course covers two years. Three hours a week. Barton Hall. Credit one hour a term.

The course of training is that prescribed by the War Department for Senior Division Units of the Reserve Officers Training Corps for basic students. The Basic Course comprises the instruction required for Basic Training common to all arms and services of the Army. For details concerning the course, see the *Announcement of the Department of Military Science and Tactics.*

Required of all able-bodied first-year and second-year male students of the College of Arts and Sciences who are American citizens and candidates for a baccalaureate degree. The requirements of Military Science and Tactics must be completed in the early terms of residence; otherwise, the student will not be permitted to register again in the University without the consent of the faculty.

ADVANCED STANDING: With the approval of the Department of Military Science and Tactics, credit may be allowed a student for all or part of the Basic Course, upon presentation of evidence that the work has been satisfactorily completed at an approved institution.

A total of three hours a week is required of all Basic Students, broken up as follows: one morning period of an hour, and one afternoon of two consecutive hours beginning at 1:40 P.M. Assignment of hours is made at registration. Uniform is not required to be worn at morning classes. Afternoon classes require uniform.

PHYSICAL TRAINING REQUIREMENTS

1. All undergraduate students must complete four terms of work, three hours a week, in physical training. DAILY, 9-10-11-12-1:40-2:40 3:40.

2. The requirement in physical training is a requirement of the first four terms and postponements are to be allowed only by consent of the Committee on Military Science and Physical Training.

3. Exemptions from the requirement may be made by the University Faculty Committee on Military Science and Physical Training when it is recommended by the Medical Office or because of unusual conditions of age, residence, or outside responsibilities. Students who have been discharged from the armed forces may be exempted.

4. For students entering with advanced standing, the number of terms of physical training required is to be reduced by the number of terms which the student satisfactorily completed (not necessarily including physical training) in a college of recognized standing. Mr. JAMES and assistants.

FOR WOMEN

6. *PHYSICAL EDUCATION FOR WOMEN* (Freshmen). Two terms. Three periods a week. Required of all freshmen: fundamentals. Required of all students: rhythmic. Other activities: archery, badminton, baseball, basketball, canoeing, folk and square dancing, field hockey, golf, individual gymnastics, modern dance, outing, rifle shooting, soccer, tennis, recreation leadership, camp counsellor training.

See department bulletin.

7. *PHYSICAL EDUCATION FOR WOMEN* (Sophomores). Two terms. Three periods a week. For description, see course 6.

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